



# A Gap Analysis of Research Being Conducted on Naval Personnel Issues

Leesa Tanner  
*Maritime OR Team*

DRDC CORA TM 2011-010  
February 2011

**Defence R&D Canada**  
Centre for Operational Research & Analysis



National  
Defence

Défense  
nationale

**Canada**



# **A Gap Analysis of Research Being Conducted on Naval Personnel Issues**

Leesa Tanner  
Maritime Operational Research Team  
DRDC Centre for Operational Research and Analysis

**Defence R&D Canada - CORA**

Technical Memorandum

DRDC CORA TM 2011-010

February 2011

Principal Author

*Original signed by Leesa Tanner*

---

Leesa Tanner

Principal Author

Approved by

*Original signed by Roy Mitchell*

---

Roy Mitchell

Section Head, Maritime, DRDC CORA

Approved for release by

*Original signed by Paul Comeau*

---

Paul Comeau

Chief Scientist, DRDC CORA

Defence R&D Canada – Centre for Operational Research and Analysis (CORA)

© Her Majesty the Queen in Right of Canada, as represented by the Minister of National Defence, 2011

© Sa Majesté la Reine (en droit du Canada), telle que représentée par le ministre de la Défense nationale, 2011

## **Abstract**

---

The Canadian Forces has undergone significant changes in recent years to become a more “integrated, unified and transformed” military. With these changes, however, there are now additional strategic and operational requirements being placed on the various environments. Unfortunately, the Canadian Navy’s establishment has become increasingly inadequate to address these requirements in addition to those that define its institutional role. While a number of initiatives have been identified that will begin to address some of the personnel issues facing the Navy, a coherent research plan in support of those initiatives has not yet been developed. To assist in such an effort, this paper provides an overview of the personnel issues that have been identified by senior naval leadership, examines what relevant research is currently being conducted to address these issues, and discusses opportunities for further research that would assist the Navy’s endeavours in ensuring it has the personnel, both in terms of numbers and skill sets, required for the fleet of tomorrow. There is a considerable amount of research that could be conducted, but this will require coherent program management and utilization of additional research capabilities, such as modelling and simulation, establishing ties with academia and industry, and international collaboration.

## **Résumé**

---

Les Forces canadiennes ont été ces dernières années l’objet d’importants changements qui en ont fait un appareil militaire plus « intégré, unifié et transformé ». Ces changements ont toutefois entraîné l’imposition d’exigences stratégiques et opérationnelles supplémentaires aux divers éléments. Malheureusement, le tableau d’effectifs et de dotation de la Marine canadienne est devenu de plus en plus inadéquat pour ce qui est de satisfaire à ces exigences en plus d’à celles qui définissent le rôle institutionnel de cet élément. Bien qu’on ait déterminé un certain nombre d’initiatives qui permettront d’aborder certaines des questions relatives au personnel auxquelles la Marine est confrontée, il reste à élaborer un plan de recherche cohérent à l’appui de ces initiatives. Pour contribuer à cet effort, on donne dans le présent document un aperçu des questions liées au personnel qui ont été recensées par les officiers supérieurs de la Marine, on y examine la recherche pertinente en cours qui vise à aborder ces questions et on y traite des possibilités d’effectuer des recherches plus poussées qui aideraient la Marine dans les efforts qu’elle déploie pour s’assurer de disposer du personnel requis pour la flotte de demain, en ce qui a trait aussi bien aux nombres qu’aux compétences. Les travaux de recherche qu’il serait possible d’effectuer sont considérables, mais il faudra alors gérer les programmes de façon cohérente et utiliser des capacités de recherche supplémentaires, telles que la modélisation et la simulation, la création de liens avec le monde universitaire et l’industrie, et la collaboration internationale.

This page intentionally left blank.

# Executive Summary

---

## A Gap Analysis of Research Being Conducted on Naval Personnel Issues

Leesa Tanner; DRDC CORA TM 2011-010, Defence R&D Canada – CORA; February 2011.

**Background:** The Canadian Navy is facing numerous personnel challenges at the same time as it is about to enter into a major transition period, during which the “fleet of today” will be replaced by the “fleet of tomorrow” over the next decade, and while it is trying to answer to new demands at the national and formation levels associated with the Canadian Forces becoming a more “integrated, unified and transformed” military. These personnel challenges include: several naval occupations being critically undermanned due to several years of not meeting recruiting targets; the requirement to retool the training system for the future fleet; the need to establish alternate approaches to fleet manning and training to ensure that competencies and leadership development are not unduly affected by the expected reduction in hull availabilities during the transition period; the requirement to improve personnel production to address expected workforce demographic challenges, such as the retirement of the Baby Boomers; the need to build the Naval Reserve up to its authorized strength; and the desire to implement more flexible human resource (HR) initiatives for the civilian component of the Navy’s workforce. And all of this bearing in mind that the Navy is at its smallest establishment size since the post-Korean conflict build-up.

**Results:** Defence Research and Development Canada (DRDC) has an extensive research program that could assist in the Navy’s efforts to address its personnel issues. It is currently undertaking 26 personnel research activities on behalf of the Navy, which are primarily focused on human factors issues but are also looking at various aspects of recruitment, selection standards, unit morale, retention, and strategic HR planning. There are also almost 200 other research activities being conducted by DRDC on personnel issues for either the Canadian Forces or other specific environments that could be of interest to the Navy. One might surmise that with this amount of research being conducted on personnel issues, there is nothing else that could be done. However, a comparison of what research is being conducted with what initiatives the Navy is undertaking to address its personnel issues reveals a multitude of additional studies that could be of assistance if they were added to the research program.

**Discussion:** There is a considerable amount of research that could assist the Navy in addressing its personnel issues. However, aside from identifying annual requirements when the DRDC call letter for Partner Group 4 (Personnel) comes out each year, there appears to have been little effort to create a multi-year personnel research programme that would identify and prioritize critical requirements, open dialogue between national and formation stakeholders, or leverage personnel research external to the Navy. To implement such a plan would require coherent program management and utilization of additional research capabilities, such as modelling and simulation, post-graduate students, academia and industry, and international collaboration.

**Future plans:** The following is therefore recommended:

- Establish a Maritime HR Research Committee which would review the projects outlined in this paper, approve and prioritize selected studies, and then endorse a five-year rolling research plan.
- Build awareness and linkages amongst the various MARCOM/MARLANT/MARPAC units involved in naval personnel issues.
- Conduct a scoping study with regards to how best utilize the HR modelling capability recently established in the Maritime Operational Research Team, and establish connections with the Right Person, Right Qualification, Right Place, Right Time (R4) HR Technology Demonstration Program.
- Begin to build relationships with academia and industry so that the personnel research capacity in the Navy can be expanded.
- Conduct a scoping study to identify opportunities for international collaboration so that best practices and alternative perspectives can be easily collected from military allies. As a first step, the feasibility of travel to Millington Tennessee, where the US Navy Recruiting Command, the Navy Personnel Research, Studies and Technologies Center, and the Navy Manpower Analysis Center are all co-located, should be explored.



## Sommaire

---

### A Gap Analysis of Research Being Conducted on Naval Personnel Issues

Leesa Tanner; DRDC CORA TM 2011-010, R & D pour la défense Canada – CARO; février 2011.

**Contexte :** La Marine canadienne doit affronter de nombreux défis liés au personnel au moment où elle est sur le point d'entrer dans une période de transition majeure au cours de laquelle la « flotte d'aujourd'hui » sera remplacée par la « flotte de demain » au cours de la prochaine décennie, et ce, pendant qu'elle essaie de répondre à de nouvelles exigences, aux échelons du pays et des formations, qui sont associées à la transformation des Forces canadiennes en un appareil militaire plus « intégré, unifié et transformé ». Les défis incluent : le fait que plusieurs groupes professionnels de la Marine manquent sérieusement de personnel parce qu'ils n'ont pas atteint leurs objectifs de recrutement depuis plusieurs années; le besoin de réoutiller le système d'instruction de la future flotte; le besoin de créer d'autres façons d'aborder la dotation en personnel et l'instruction de la flotte pour s'assurer que la réduction prévue des navires disponibles durant la période de transition n'a aucun effet indu sur le perfectionnement des compétences et du leadership; le besoin d'améliorer la production de personnel pour affronter les défis démographiques prévus liés aux effectifs, tels que le départ à la retraite des enfants de l'après-guerre; le besoin de doter la Réserve navale des effectifs autorisés; et le désir de mettre en œuvre des initiatives plus souples en matière de ressources humaines (RH) pour l'élément civil des effectifs de la Marine. Le tout en ne perdant pas de vue que la taille du tableau d'effectifs et de dotation de la Marine est la plus petite depuis l'accroissement du potentiel militaire qui a suivi le conflit coréen.

**Résultats :** Recherche et développement pour la défense Canada (RDDC) a élaboré un important programme de recherche qui pourrait aider la Marine dans les efforts qu'elle déploie pour régler ses problèmes de personnel. L'organisme effectue actuellement pour le compte de la Marine 26 activités de recherche sur le personnel qui portent surtout sur les questions de facteurs humains, mais dans le cadre desquelles on examine aussi divers aspects du recrutement, les normes de sélection, le moral des unités, le maintien en poste et la planification stratégique des RH. RDDC effectue également presque 200 autres activités de recherche sur les questions relatives au personnel, soit pour les Forces canadiennes, soit pour d'autres environnements déterminés qui pourraient intéresser la Marine. On pourrait présumer que, vu l'importance de la recherche effectuée sur les questions relatives au personnel, il n'y a rien d'autre à faire. Toutefois, la comparaison entre la recherche en cours et les initiatives que la Marine entreprend pour régler ses problèmes de personnel révèle une multitude d'études supplémentaires qui pourraient aider si elles étaient ajoutées au programme de recherche.

**Examen de la question :** Il existe un grand nombre de travaux de recherche qui pourraient aider la Marine à régler ses problèmes de personnel. Cependant, à part la détermination des besoins annuels lorsque la lettre d'appel de RDDC relative au groupe partenaire 4 (Personnel) sort chaque année, il semble n'y avoir eu que peu d'efforts visant à créer un programme pluriannuel de recherche sur le personnel qui permettrait de cerner les besoins essentiels et d'établir les priorités connexes, d'ouvrir le dialogue entre les intervenants nationaux et ceux

en formation, ou de mettre à profit la recherche sur le personnel effectuée à l'extérieur de la Marine. La mise en œuvre d'un tel plan exigerait une gestion cohérente du programme et l'utilisation de capacités de recherche supplémentaires, telles que la modélisation et la simulation, les étudiants de troisième cycle, le monde universitaire et l'industrie, et la collaboration internationale.

**Recherches futures :** On recommande par conséquent ce qui suit :

- Mettre sur pied un comité de recherche en RH (Mer) dont les membres examineraient les projets décrits dans le présent document, approuveraient les études choisies et les classeraient par ordre de priorité, puis appuieraient un plan de recherche continu et quinquennal. La mise sur pied d'un tel comité faciliterait également la sensibilisation des diverses unités de COMAR, de FMAR(A) et de FMAR(P) mêlées aux questions relatives au personnel de la Marine, et la création de réseaux entre ces unités.
- Mener une étude de délimitation de l'étendue en rapport avec la meilleure façon d'utiliser la capacité de modélisation des RH créée récemment dans ERO(M). La rétroaction préliminaire provenant des intervenants indique que la mise au point de divers outils de modélisation, par opposition au seul outil utilisé à l'heure actuelle, en vue de traiter des questions de complexité variable relatives au personnel de la Marine améliorerait l'utilité de la capacité de modélisation des RH pour la Marine. Il faudrait également créer des connexions avec le Programme de démonstration de technologies de RH visant à établir la bonne personne, ayant les bonnes habiletés, au bon endroit et au bon moment (4B).
- Améliorer la capacité avec laquelle effectuer la recherche sur le personnel pour la Marine, lorsque les ressources le permettent. La marche à suivre évidente consiste à établir des relations avec le monde universitaire et l'industrie au moyen de contrats, mais il y aurait aussi lieu d'examiner d'autres méthodes. Par exemple, un grand nombre de projets de recherche sur le personnel sont en cours pour les FC, qui devraient être examinés en ce qui a trait à leurs répercussions sur la Marine. Il y a lieu d'examiner plus à fond les moyens à utiliser pour effectuer cet examen.
- Établir des relations internationales de manière à pouvoir recueillir facilement des alliés militaires des pratiques exemplaires, d'autres perspectives et des leçons tirées. Au moment de la publication, l'adhésion au Groupe technique des facteurs humains 9 – Intégration des systèmes humains (Mer) du TTCP vient tout juste d'être accordée à l'analyste en RH stratégiques du D Pers Mar. Des contacts établis aux conférences d'analyse des effectifs plus tôt au cours de l'année ont également produit des invitations de la part de la US Navy à discuter plus en détail de problèmes communs auxquels les deux marines sont confrontées.

# Table of Contents

---

Abstract.....	i
Executive Summary.....	iii
Sommaire.....	v
Table of Contents .....	vii
Acknowledgements .....	ix
1. Introduction .....	1
1.1 Background .....	1
1.2 Aim.....	2
2. The Navy's Personnel Situation .....	3
2.1 Maritime Commander's Strategic Goals .....	3
2.2 MARCOM Strategic Assessment 2009 .....	5
2.3 CMS Strategic HR Campaign Plan .....	8
2.4 Other Naval Personnel Activities .....	13
2.5 Summary .....	15
3. DRDC Science and Technology Program .....	16
3.1 DRDC S&T Program Structure.....	16
3.2 DRDC S&T Program Delivery .....	19
3.3 Maritime Research Plan .....	21
3.4 Personnel Research Being Conducted by DRDC.....	21
3.5 Summary .....	35
4. Gap Analysis .....	36
4.1 Attraction, Recruiting & Selection .....	36
4.2 Training and Education .....	39
4.3 Occupational Management.....	40
4.4 Morale and Welfare.....	42
4.5 Compensation.....	43

4.6	Families .....	44
4.7	Career Management.....	44
4.8	Succession Planning .....	45
4.9	Employment Management.....	46
4.10	Retention and Release .....	47
4.11	Honour and Recognition.....	48
4.12	Naval Reserves .....	48
4.13	Civilian Workforce.....	48
4.14	Strategic Planning.....	49
4.15	Summary .....	50
5.	Discussion .....	51
5.1	Proposed Five-Year Research Plan .....	51
5.2	Research Considerations .....	52
6.	Conclusion.....	56
6.1	Summary .....	56
6.2	Recommendations .....	56
	References .... ..	57
	Annex A – CMS Strategic Campaign Plan Activities .....	59
	Annex B – DRDC Personnel Research Directly Related to the Navy.....	67
	Annex C – Other DRDC Personnel Research That Could Have Implications for the Navy ....	73
	Annex D – Other DRDC Research That Could Have Personnel Implications for the Navy..	103
	List of acronyms .....	119
	Distribution list.....	125

## **Acknowledgements**

---

I would like to thank my predecessor, Mr. Jason Dunn, for providing some of the ideas for potential research that are discussed in this paper. His input is much appreciated.

This page intentionally left blank.

# 1. Introduction

---

*“The navy has arrived at the threshold of a major transition period, in which human resources, rather than funding, will likely prove to be the fundamental limiting factor on the successes we achieve during the planning period.”*  
(MARCOM, 2008a)

## 1.1 Background

The Canadian Navy is on the threshold of a major transition period, in which the fleet of today will be replaced by the fleet of tomorrow. Over the next decade, the Navy will be modernizing or replacing all of its major surface combatants, while at the same time introducing into service a new maritime helicopter and a new class of patrol ships. A major challenge for the Navy as it embarks on this transition period is “to successfully deliver on the most comprehensive and compressed program of fleet renewal it has faced in its history from within the smallest establishment it has possessed since the post-Korean conflict build-up, all the while continuing to successfully generate maritime forces for operations” (MARCOM, 2007).

A number of external and internal human resource (HR) factors have contributed to the current size of the Navy’s establishment, which are placing it under significant pressure. According to the *Maritime Command (MARCOM) Strategic Assessment for 2008* (MARCOM, 2007), these HR factors include:

- the beginning of a “major demographic compression” of the Navy’s uniformed and civilian workforces;
- a highly competitive domestic marketplace for technically inclined workers, which has made it difficult to reach specific recruiting targets for naval occupations, many of which are now in distress;
- new demands at the national and formation levels associated with Canadian Forces (CF) transformation and the stand-up of the new operational commands; and
- the need to support CF operations in Afghanistan.

As the Navy tries to manage its day to day business with “the equivalent of four ships’ companies” worth of vacant billets, according to the *MARCOM Strategic Assessment for 2009* (MARCOM, 2008b), the question comes to mind as to how scientific research might assist in addressing some of the critical personnel issues facing the Navy today and in the future. Defence Research and Development Canada (DRDC) has an extensive science and technology (S&T) program which covers a number of broad areas, but it is not readily apparent as to how much of the program is relevant to the Navy’s pressing personnel issues.

## **1.2 Aim**

The aim of this paper is to provide an overview of the personnel issues facing the Canadian Navy today, examine what research is currently being conducted within DRDC to address these issues, identify where further research may be of utility, particularly in addressing strategic personnel issues, and discuss how a coherent personnel research plan may be implemented for the Navy.



## **2. The Navy's Personnel Situation**

---

### **2.1 Maritime Commander's Strategic Goals**

As outlined in the *Maritime Commander's Intent for 2009 to 2012* (MARCOM, 2008a), the Chief of Maritime Staff (CMS) has three strategic goals: 1) renewing the navy institution, 2) succeeding in operations today, and 3) succeeding in operations tomorrow. A number of critical personnel issues are intricately woven into these goals, which are discussed below.

#### **2.1.1 Renewing the Navy Institution**

Institutional renewal will require the Navy to formalize its succession-planning system so that the Navy's future leaders are prepared for challenges at the national/strategic-level and be positioned to effectively compete for leadership appointments within the broader CF and Department of National Defence (DND) (MARCOM, 2008a). By Fiscal Year (FY) 10/11, it is expected that a new succession planning model will be fully entrenched in the Navy's officer and senior non-commissioned member (NCM) career management decision making.

#### **2.1.2 Succeeding in Operations Today**

In terms of succeeding in operations today, the most immediate personnel issues for the Navy relate to recruiting, according to the *Maritime Commander's Intent for 2009 to 2012* (MARCOM, 2008a). Over 50% of naval occupations are in the "red" category, which is defined as being at less than 90% of the preferred manning level (PML) (DGMPR, 2009b). These include: Marine Systems Engineering Officer (MS ENG), Naval Combat Systems Engineering Officer (NCS ENG), Marine Engineering Mechanic (MAR ENG MECH), Naval Communicator (NAV COMM), Naval Electronics Technician (Radar) (NE TECH (R)), Naval Electronics Technician (Sonar) (NE TECH (S)), Naval Weapons Technician (NW TECH), and Sonar Operator (SONAR OP). "Get well" plans are being implemented for each of these distressed occupations, which have resulted in most of them meeting their Strategic Intake Plan (SIP) objectives for FY 09/10 (DGNP, 2010).

Efforts are also being aimed at examining how to increase the "flexibility and capacity of the existing military and civilian workforces through a more responsive and agile personnel system" for the Navy, according to the *Maritime Commander's Intent for 2009 to 2012* (MARCOM, 2008a). In addition to implementing measures to restore the Navy to its established strength, longer-term objectives include:

- Retooling the Navy's training system for the future fleet, which will include "the transition from existing training assets through the delivery of contractor-supplied cadre training to a new steady state";

- Establishing alternate approaches to fleet manning and training to ensure that “the competency of fleet personnel and leadership development is not unduly affected by the expected reduction in hull availabilities”;
- Implementing ways and means to improve personnel production to address expected workforce demographic challenges; and
- Continuing to build the Naval Reserve (NAVRES) to its authorized strength.

Civilian workforce planning also needs to be integrated within the Navy’s strategic business-planning framework, as “there is no tighter coupling between civilian establishment and operational output than in the Navy, particularly in the Fleet Maintenance Facilities”, as discussed in the *MARCOM Strategic Assessment for 2008* (MARCOM, 2007). The *Maritime Commander’s Intent for 2009 to 2012* (MARCOM, 2008a) outlines the following objectives related to the civilian workforce, highlighting more flexible HR initiatives:

- Increase apprenticeship intakes to the levels required to match projected attrition rates, with outreach efforts targeted at youth and employment equity (EE) groups;
- Target growth in the civilian workforce towards key effects, including “the need to maintain the Navy’s capacity to support fleet operations, as well as to increase its capacity to renew infrastructure and develop the future maritime force”;
- Target continuous learning towards “job training requirements, individual learning plans for workforce renewal and succession planning, leadership and change management, and language training”; and
- Target recruitment capacity for “a collective staffing/classification process that will allow the establishment of pre-qualified pools”.

### **2.1.3 Succeeding in Operations Tomorrow**

In terms of succeeding in operations tomorrow, the Director General Naval Personnel (DGNP) is expected to address the ways and means to develop the Navy’s capacity to undertake long-term HR planning. As a first step, an estimate of the MARCOM HR situation is to be completed that will help to identify the HR studies and plans that will be required to prepare the Navy for the arrival of the future maritime force. According to the *Maritime Commander’s Intent for 2009 to 2012* (MARCOM, 2008a), this estimate will examine all pertinent factors, including: “the follow-on to the Military Occupational Structure Analysis Redesign and Tailoring (MOSART) Project; the requirements for future other ranks and officer production; future fleet manning and crewing concepts, including regular/reserve mix for major and minor combatants; the naval training system; and evolving personnel requirements at the tactical, operational and strategic levels”.

As a follow-on effort to the HR estimate, a comprehensive MARCOM establishment review will also be conducted to address emerging requirements arising from “the growing complexity of maritime operations in an integrated and joint battlespace”, according to the

*Maritime Commander's Intent for 2009 to 2012* (MARCOM, 2008a). The objective of this review is “not just to position the Navy’s personnel and training systems for the delivery and introduction of new capabilities into the fleet, but also to integrate the Regular and Reserve components of the maritime force both at sea and ashore, particularly in enhancing MARCOM’s capacity to support the integrated and transformed CF” (MARCOM, 2008a).

## **2.2 MARCOM Strategic Assessment 2009**

With the number of personnel-related objectives identified as part of the Navy’s strategic goals, it should not be a surprise that two of the three most critical challenges in meeting those goals also have a personnel focus, according to the *MARCOM Strategic Assessment for 2009* (MARCOM, 2008b).

### **2.2.1 Personnel Required to Deliver the Future Fleet**

The first personnel-related challenge pertains to the Navy’s ability to provide capital acquisition projects with the personnel required to deliver the future fleet. According to the *MARCOM Strategic Assessment for 2009* (MARCOM, 2008b), “the recapitalization challenge is exacerbated by the personnel reductions of the mid-90s onward, particularly in the materiel acquisition domain, that diminished the Navy’s capacity to conceive, design, and build the future maritime force. While some changes in procurement practices over the last decade mean that the capital projects will be delivered by far smaller staffs than was the practice during the last recapitalization of the late-80s through the mid-90s, the demand remains significant in relation to the smaller naval personnel establishment.” It is noted in the *MARCOM Strategic Assessment for 2009* (MARCOM, 2008b) that presently the Navy is temporarily re-allocating MARCOM military positions and personnel away from Force Generation and Employment activities towards these “now more pressing” Force Development activities, but that is considered simply a stop-gap measure. Unfortunately, these actions are not sufficient to meet Assistant Deputy Minister (Materiel) (ADM(Mat)) requirements, and any further reallocations towards ADM(Mat) from the Navy will require an overhauling of the MARCOM organization “that would be at the cost of the Navy’s ability to generate and sustain operations” (MARCOM, 2008b). The Naval Strategic Assessment Team (NSAT) is currently looking at re-organizing the Navy along functional lines, which hopefully will alleviate these pressures.

### **2.2.2 Sustaining the Navy’s Human Resources**

The second personnel-related challenge pertains to the Navy’s ability to sustain its personnel resources. According to the *MARCOM Strategic Assessment for 2009* (MARCOM, 2008b), there are several fundamental personnel pressures on today’s Navy that will impact both the Navy’s operational output in the coming years as well as the Navy’s institutional capabilities. As mentioned briefly in the Introduction, these pressures include a growing CF demand for personnel from an already significantly under-strength Navy, which in turn is only exacerbated by continued shortfalls in recruiting, rising attrition, and an establishment size

that has not been increased to compensate for the demands of the new CF command structure, the increased demands associated with the Navy's leadership role in the interdepartmental Marine Security Operations Centres (MSOCs), or the introduction of the Arctic/Offshore Patrol Ship (AOPS).

### **2.2.2.1 Current and Projected Strength**

According to the *MARCOM Strategic Assessment – 2010 Amendment* (MARCOM, 2010), the Regular Force Navy is currently at 89% of its trained effective strength (TES). However, when a 15% volatility rate due to maternal/paternal leave, sick leave, required training and other non-availability demands (e.g. incremental manning) is taken into account, the Navy is actually facing a 26% shortage. This shortage is expected to worsen before the efforts now underway in the Navy will begin to rectify the situation. It is anticipated that restoring specific occupations that are distressed due to the shortage of personnel is likely to take many years, as it takes a considerable amount of time to train personnel to the levels where the shortages exist..

### **2.2.2.2 Volatility in Ship Crewing**

As the smallest of the three environmental services, the Navy is at the limits of its capacity to absorb incremental taskings while also trying to manage all the other personnel issues that impact on fleet manning, such as professional courses, maternity and parental leave, medical absences and so forth, according to the *MARCOM Strategic Assessment for 2009* (MARCOM, 2008b). It has become evident that the Navy's current level of "personnel volatility", which impacts the work-life balance and stability of the Navy's men and women, is posing a risk to personnel retention and the Navy's ability to support the broader institutional and operational needs of the CF with trained maritime personnel. Consequently, the Navy needs to regenerate itself by "focussing its personnel on its core business, even if in the near to medium term it comes at the expense of other personnel demands within the broader CF" (MARCOM, 2008b), because otherwise the Navy's readiness and fleet competency, and ultimately its ability to meet its operational commitments, will be adversely impacted. The NSAT and the follow-on Naval Strategic Implementation Team will be working to towards possible solutions.

### **2.2.2.3 The Navy Institution**

The only way to presently generate maritime competencies for the Regular Force is by service at sea, by the throughput of 17 major warships and four submarines. Capacity limits of that production base are now being observed at the officer ranks of Navy Lieutenant (Lt(N)) to Navy Captain (Capt(N)). "Promotion to fill an expanded CF command structure is both inadequate to meet demand and yet so large as to aggravate the shortage of junior officers, which has resulted in hollowing out of the core" (MARCOM, 2008b). Given that the Navy's officer occupations are under strength, it is no longer possible to meet all of the CF's demands for naval officers, particularly in light of a transformed CF command structure. And any

attempt to meet current demands by reducing operational output will only exacerbate the problem. “Focussing on core activities will achieve a better balance between today’s force generation and employment activities and the effort to deliver tomorrow’s maritime forces” (MARCOM, 2008b).

#### **2.2.2.4 The Naval Reserve**

The NAVRES has been under-strength for the last ten years as the NAVRES has been unable to recruit beyond the level of annual attrition, according to the *MARCOM Strategic Assessment for 2009* (MARCOM, 2008b). With the NAVRES not having grown over the years, two new trends - the attrition from the Kingston-class of sailors with many years of continuous full-time service at sea and the growing number of component transfers to the Regular Force - are now further reducing its ability to meet its tasks. For example, crewing for the Kingston-class has been reduced below the required level, and the pool of trained reservists from which to draw for other tasks, such as OP PODIUM, has been also reduced.

#### **2.2.2.5 The Navy’s Civilian Establishment**

The Navy’s civilian establishment is currently 9% understaffed, according to the *MARCOM Strategic Assessment for 2009* (MARCOM, 2008b). This shortfall has been growing steadily for years, driven mainly by the demographics of an aging labour force and then aggravated by the insufficient capacity within the Assistant Deputy Minister (HR-Civilian) (ADM(HR-Civ)) organization to deal with the outflow. The situation is also expected to worsen, as 59% of the current civilian workforce is eligible to retire by 2018 (MARCOM, 2008b).

#### **2.2.2.6 Integrated Personnel Demand**

As discussed above, the Navy’s overall establishment, both in terms of personnel and positions, is currently too small to deal simultaneously with “pressing Force Development demands, essential Force Generation demands, new and growing Force Employment demands, and ongoing CF Transformation demands” (MARCOM, 2008b). These pressures on the Navy’s Regular Force establishment are in turn having a detrimental effect on the Navy’s Reserve Force and civilian personnel establishments. “Growing vacancies in the Regular Force establishment are exacerbating the pressures felt on all establishments, as organizations attempt to compensate for vacancies: firstly, by seeking to backfill from a diminishing pool of naval reserve personnel; secondly, by increasing the tasks of remaining Regular Force or civilian personnel; and thirdly, by seeking to create new civilian positions” (MARCOM, 2008b).

## **2.3 CMS Strategic HR Campaign Plan**

In response to the Navy's strategic goals and the HR challenges currently facing the Navy, MARCOM staff have recently developed a *CMS Strategic HR Campaign Plan for 2009 to 2013* (DGMPR, 2009a). The objective of this plan is "a responsible Mil Pers Management Framework that ensures the Navy has adequate numbers of the best people with the proper education and training that are mentally and physically fit, motivated, well supported, fairly compensated, respected, recognized, and never forgotten". To achieve this end-state, 64 specific activities under 14 lines of operation have been identified, which are outlined in Annex A. These activities are typically tactical in nature, focussing primarily on issues affecting the success of operations today. Recent achievements are briefly discussed below.

It should be noted that, in order to undertake these activities, priority has also been given to manning various naval personnel organizations. Positions within the N1 organizations in the Formations, as well as the Directorate of Maritime Personnel (D Mar Pers) and the Directorate of Maritime Training and Education (DMTE) in National Defence Headquarters (NDHQ), have been filled to the fullest extent possible (DGMPR, 2009b).

### **2.3.1 Recruiting**

With recruiting being one of the most critical personnel issues for the Navy, it is not surprising that activities related to attraction and recruitment compose the largest portion of the *CMS Strategic HR Campaign Plan* (DGMPR, 2009a). There are currently 18 activities listed under this category, with resources being devoted to establishing recruiting teams for distressed occupations, maximizing the use of CO-OP programs and subsidized education plans (SEPs), examining the possibility of enrolment bonuses, and targeting attraction and recruitment activities. For example, the Great Lakes Deployment had a strong recruiting focus in 2009, with a program designed to highlight the Navy's technical occupations and the NCM SEP to visiting students and their influencers (DGMPR, 2009b). The CF College Opportunities Database (CFCOD) has also been successfully stood up. "Colleges can now do an on-line comparison of Navy qualification standards versus their own training programs. In the future, the CFCOD will form the basis of enhanced Prior Learning and Reporting (PLAR) processing and civilian career accreditation, which should streamline enrolment processes" (DGMPR, 2009b).

### **2.3.2 Individual Training and Education**

Activities under the *CMS Strategic HR Campaign Plan* (DGMPR, 2009a) that relate to Individual Training and Education (IT&E) include: the identification of training requirements related to the Halifax Class Modernization (HCM), addressing coastal training imbalances, developing accreditation equivalents and reducing professional development requirements that impact personal time. For example,

“several IT&E policies have been amended to identify e-learning as an alternative (when feasible) for delivering knowledge elements of training. This could potentially shorten the duration of training and could provide options to deliver training any time/any place, and not just on one coast. The CMS E-Learning Strategy to Action Plan is currently being reviewed by all stakeholders, and staff positions are being established to address e-learning options at the Training Establishment level” (DGMPR, 2009b).

A new structure and process, the Job-Based Specifications/Qualification Requirements Analysis (JBS/QRA), has also identified significant reductions in training, as requirements are now to be identified by a specific job vice all jobs at a rank level. According to the Director General Maritime Personnel and Readiness (DGMPR) (2009b), “proposed modifications for occupations range from minimal to ‘wholesale structure change’. The process facilitates the modularization of training, reduced duration of training and delivery of just in time training for specific jobs... Some academic training courses are now shorter, with some lessons eliminated, reduced or shifted to other courses. Several technical courses have also been shortened significantly. Implementation of changes to the training system will be phased in as resources allow.”

### **2.3.3 Operations/Refresher Training**

Only one activity currently falls under the Operations/Refresher Training line of operation. Refresher training requirements were being reviewed by the Fleet Efficiency Working Group (FEWG) until it was stood down. Most recently it has been recommended that this activity actually be removed from the *CMS Strategic HR Campaign Plan* (DGMPR, 2009a), since the Commander Maritime Atlantic (COMD MARLANT) is already responsible for occupational training policy development and conduct, which includes refresher training requirements.

### **2.3.4 Occupational Management**

As part of the *CMS Strategic HR Campaign Plan* (DGMPR, 2009a), the Occupational Management line of operation encompasses five activities: 1) review of Qualification Standards and Plans (QSPs) for naval occupations; 2) provision of project manning updates; 3) creation of a Future Requirements cell within D Mar Pers to look at future personnel needs and develop plans to address Navy requirements; 4) conduct of unit level/occupation establishment reviews; and 5) resolution of the Shipborne Air Controller (SAC) way ahead. The QSP review and the project manning updates have been ongoing, while the Future Requirements cell has just recently been stood up. The SAC way ahead has been resolved with the Naval Combat Information Operator (NCI OP) occupation taking on those responsibilities. The unit level/occupation establishment review, which will follow the Maritime Force Structure Review, is in abeyance until the NSAT has a clear line of direction (DGMPR, 2009a).

### **2.3.5 Morale and Welfare**

The Navy intends to establish consistent deployment/reintegration processes under this line of operation, Morale & Welfare, in order to ensure that all naval personnel are subjected to a complete reintegration process upon return from international deployments. A MARCORD has been drafted and is currently awaiting approval, according to the *CMS Strategic HR Campaign Plan* (DGMPR, 2009a).

### **2.3.6 Compensation**

The Compensation line of operation contains four activities that are examining capability allowances, leave entitlements and renewal allowances, in addition to trying to resolve several outstanding compensation items. According to DGMPR (2009b), a submission was made to Treasury Board on 10 May 2009 that contained three Navy-specific compensation items: 1) Specialist Pay Methodology, which was approved back to 2004; 2) Submarine Crewing Allowance (SUBCA), which was also approved; and 3) Port Inspection Diver Allowance (PIDA), which was not approved but those who hold full-time positions with the Fleet Diving Units in Halifax and Esquimalt will receive the Clearance Diver Allowance as an interim measure. Other ongoing activity related to compensation includes: 1) a review of designated positions for the Submarine Speciality Allowance (SUBSPA), which is almost completed on the East Coast and will soon begin on the West Coast; 2) a review of the Environmental Allowance, as a result of the introduction of the Land Duty Allowance for Army personnel; and 3) determining if current specialist pay would be applicable to the NAV COMM occupation, since it is the only operator occupations that does not have similar compensation (DGMPR, 2009b).

A proposal to reduce the number of years of service required to earn 30 days of annual leave was also presented to Armed Forces Council (AFC) for support, but the motion was denied. Similarly, Restraint Legislation that remains in effect until spring 2011 precludes the approval of new or enriched compensation and benefits outside of very narrow parameters, so the creation of a proposed terms of service (TOS) renewal bonus, which would entice people to stay rather than release, is on hold (DGMPR, 2009a).

### **2.3.7 Families**

Recognizing the impact that the military way of life can have on families, the Navy, in conjunction with the Chief of Military Personnel (CMP), is currently looking at: 1) ways to mitigate the disruption of spousal earning through the CF Family Employment Working Group; and 2) the funding provided to Military Family Resource Centre (MFRC) programs so that additional services, such as daycare, may be expanded (DGMPR, 2009a).



### **2.3.8 Career Management**

Two of the three activities under the Career Management line of operation in the *CMS Strategic HR Campaign Plan* (DGMPR, 2009a) have been completed. More flexible TOS have been introduced to encourage people to accept new TOS without needless penalties; and the current version of the CF Taskings, Plans and Operations (CFTPO) process now provides the required flexibility. The third activity, getting sailors to sea faster in order to address the current manning shortfalls in the Navy, is focussed on the reduction of Qualification Level 3 (QL3) training times as QSPs are amended. Recent improvements in the Navy's enrolment figures should also assist in getting more sailors onboard ships soon (DGMPR, 2009a).

### **2.3.9 Succession Planning**

Formalized succession planning was introduced in the Fall of 2008 (DGMPR, 2009b). The objective of this initiative is to identify senior officers and NCMs who have the talent and time remaining to serve to become the Navy's most senior leaders, and to manage their training and development to ensure that they are properly prepared for the challenges ahead. The inaugural Naval Succession Board (NSB) dealt with officers primarily at the Capt (N) and Commander (Cdr) levels, with some effort devoted to the Lieutenant Commander (LCdr) rank. The Strategic HR Team in DGMP, which is responsible for succession planning, has been tasked with further defining the concept of succession planning for officers and possibly extending it to senior NCM ranks as a supplement to the CF processes already in place to support selection for the most demanding NCM positions.

### **2.3.10 Employment Management**

The Employment Management line of operation is the second largest within the *CMS Strategic HR Campaign Plan* (DGMPR, 2009a), with 11 activities ranging from reviewing CMS manning priorities, to reducing optempo/perstempo, re-introducing Reduced Duty Watch, and reviewing the shipboard maintenance philosophy of the Navy. Retention of personnel in critical occupations is becoming a greater issue due to high optempo (DGMPR, 2009a). For example, demand for personnel to support Task Force Afghanistan (TFA) has not waned. The Navy continues to provide incremental personnel support to this CF priority. As of July 2009, there were 78 MARCOM personnel deployed as part of TFA with an additional 173 personnel slated for upcoming deployment (DGMPR, 2009b). In an effort to deal with the demands on naval personnel, perstempo management cells have been stood up in MARLANT and Maritime Pacific (MARPAF), incremental taskings have been prioritized, and personnel volatility data collection is being standardized (DGMPR, 2009a).

### **2.3.11 Retention**

Just as recruiting is critical to the Navy, so too is the retention of its trained and experienced personnel. The current level of attrition is at 9%, whereas the past six year average has been

6.5% (DGMPR, 2009b). Part of the reason for this increase is the fact that a significant number of naval personnel have 20 years or more of service and are opting for other careers. Attrition for those with five to 18 years of service continues to be minimal.

There are six activities in the Retention line of operation, including: the creation of retention management cells; the introduction of a mandatory commanding officer's interview prior to release in order to better understand why people are leaving and perhaps mitigate some of the loss; and the establishment of policy to have released members get in contact with their local NAVRES Divisions (NRDs) and vice versa. In addition to these activities, the perceived disparity for promotion to Sub-Lieutenant (SLt) in the Maritime Surface and Sub-surface (MARS) officer occupation as compared to other occupations has been addressed, with the decision to promote MARS officers to SLt once they have completed one year in rank and MARS IV training. Jobs currently being done in the National Capital Region are also being reviewed to determine if they could be done elsewhere and therefore provide greater geographical stability to naval personnel. And lastly, a recent CMP initiative that requires the CF to take retired personnel back into their occupation at their former rank is being examined from a Navy perspective, as it could have serious repercussions for those already serving in occupations that are effectively "at strength" since it would curtail possible promotion opportunities (DGMPR, 2009a).

### **2.3.12 Recognition**

The aim of this line of operation is to improve the Navy Awards and Recognition Program, which has resulted in the Sea Service Badge and Ops Service Medal being pursued, and the Sailor of the Month/Quarter being instituted in both MARLANT and MARPAC, according to the *CMS Strategic HR Campaign Plan* (DGMPR, 2009a).

### **2.3.13 Communications**

As also noted in the *CMS Strategic HR Campaign Plan* (DGMPR, 2009a), it needs to be determined what role Maritime Staff Strategic Communications should have with respect to internal navy communications of personnel related issues, in order to improve internal communications within the Navy. At this point, the Matelot continues to be used as the primary personnel update mechanism.

### **2.3.14 Naval Reserves**

The last line of operation in the *CMS Strategic HR Campaign Plan* (DGMPR, 2009a) pertains to NAVRES issues. According to DGMPR (2009b), the NAVRES is currently about 17% short of its authorized personnel ceiling, but new initiatives, such as a High School Co-op Memorandum of Understanding (MOU) in Thunder Bay, are starting to show positive results. NAVRES recruiting in the past year has, by and large, been successful with Naval Reserve Training Division (NRTD) Borden nearing full capacity during the Summer of 2009. The

challenge, however, is not with intake, but rather the retention of the TES, which will continue to be the main challenge for the next five years (DGMPRA, 2009b).

There are five activities in the *CMS Strategic HR Campaign Plan* (DGMPR, 2009a) that have commenced to help address some of the issues for the NAVRES: the re-confirmation of the strategic role of the NAVRES and the update of the Class C Maritime Coastal Defence Vessels (MCDVs), both of which are awaiting the outcome of the Force Structure Review; and the harmonization of HR policies between Regular Force and Reserve Force, the examination of part-time versus full-time employment options, and the de-linking of benefits from the Reserve Classes of Service, all of which are CMP-led initiatives. The sixth activity under this line of operation, the Reserve Force backfill policy, has been completed, resulting in the policy that backfills are for a maximum of two years when it has been confirmed by the career manager that the position cannot be filled with a Regular Force individual (DGMPR, 2009a).

## **2.4 Other Naval Personnel Activities**

### **2.4.1 Officer and NCM Professional Development**

The Continuing Education Officer Training Plan (CEOTP) requires officers to complete a degree by the end of their short engagement (SE), which is either a nine or 12 year contract depending on when they were recruited. The challenge for MARS officers is that this is an almost impossible timeframe given that there is little time for anything but MARS-related training during this time period. DMTE and D Mar Pers are looking at viable alternatives to address this issue (DGMPR, 2009b).

For senior NCM professional development, the Navy has now allocated three seats for Chief Petty Officers First Class (CPO1) on each Officer Professional Military Education (OPME) residential course (MARGEN 25/09). Candidates are nominated based on succession planning requirements, and there is also consultation underway with the Royal Military College (RMC) to see if the 12-week program can be expanded from two courses to three courses annually on each coast (DGMPR, 2009b).

### **2.4.2 Military Performance Management Program**

A new appraisal system is being developed by CMP to eventually replace the Canadian Forces Performance Appraisal System (CFPAS). This will take several years before implementation, but the Navy is engaged in the preliminary conceptual development (DGMPR, 2009b).

### **2.4.3 AOPS Crewing**

An initial AOPS crewing concept was developed in 2008, with subsequent development of an initial strawman watch and station bill. This has formed the basis for ongoing discussion and development as the vessel configuration and concept of operations evolve, including the apparent requirement for a Regular/Reserve Force mix. It has been estimated that the AOPS will require approximately 450 new positions, and it has been noted that if this desired level of establishment growth is not approved, “the Navy could be faced with some very tough decisions to make” (DGMPR, 2009b).

### **2.4.4 Halifax Class Modernization**

Detailed scoping of the personnel challenges that will be faced during the HCM/Frigate Life Extension (FELEX) period has commenced and will continue to require careful planning and management. For example, the HCM Training Working Group, led by DMTE, is addressing HCM training implementation and scheduling requirements. Using a phased approach, the coordination of training deliverables and the development of a synchronized training schedule to support both legacy training and conversion training are top priorities for this particular Working Group (DGMPR, 2009b).

### **2.4.5 Personnel Requirements for the ORCA Class**

It was originally intended that the YAG yard craft would be replaced by the ORCA class and would be crewed with the existing establishment based on its perceived role as an auxiliary support craft (DGMPR, 2009b). With recent experience and the understanding that the ORCA platform is more capable, and indeed is an ideal platform for naval training of all types, a need to identify additional personnel to crew the ORCA on an ongoing basis has been identified. The positions to support this Force Generation capability have been documented and a request for additional billets has been submitted to the Vice Chief of Defence Staff (VCDS) for consideration.

### **2.4.6 Civilian Personnel**

The *MARCOM Strategic Assessment for 2008* (MARCOM, 2007) identified the need for civilian workforce planning to be integrated within the Navy’s strategic business planning framework. In a joint effort, the Director Maritime Civilian Personnel Requirements (DMCPR) and Director General Maritime Strategic Management (DGMSM) teams have developed “a framework that will assist business planners and human resource planners to more effectively manage the Navy’s civilian personnel resources from both a business planning perspective and an HR planning perspective” (DGMPR, 2009b).

## **2.5 Summary**

With the many activities underway within the Navy to address its personnel issues, the situation might be considered to be well in hand. However, as the Navy continues to struggle with recruiting and retention issues, as well as many other issues related to the transition to the future fleet, the need for assistance is evident. The role of research and analysis has not yet been closely examined to date, but the next chapter should help to illustrate where such expertise could be of assistance to the Navy.

### 3. DRDC Science and Technology Program

---

*DRDC focuses its science and technology activities in areas of critical importance to future Canadian Forces operations. Our key objective is to ensure that the Forces are technologically prepared for operating in a defence environment that will see increased emphasis on interoperability with allies, technology-driven warfare and new asymmetric threats. (DRDC, 2008)*

#### 3.1 DRDC S&T Program Structure

According to the *DRDC Annual Report for 2007 – 2008* (DRDC, 2008), the DRDC S&T Program is divided into six groups: Integrated Capabilities; Maritime; Land; Air; Personnel; and Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR). Each of these groups is further divided into thrusts, which are packages of scientific and technological activities, addressing a broad spectrum of issues.

##### 3.1.1 Integrated Capabilities

The Integrated Capabilities S&T Program, otherwise known as Partner Group 0 (PG 0), aims to “achieve objective and timely decision support, anticipate future challenges, and foster innovation through various projects and initiatives to ensure that the CF/DND have the capabilities necessary for assigned missions in line with defence policy” (DRDC, 2008). There are currently four research thrusts associated with PG 0:

- Strategic and Future Environment (10a) <sup>1</sup>,
- Operations Analysis and Integrated Solutions (10b),
- Special Operating Forces Command (10c), and
- Hazard Protection (10d).

It should be noted that the fourth thrust, Hazard Protection, was just recently added when the Personnel Protection S&T Program (PG 6), which aimed at improving operational effectiveness and decreasing the morbidity and mortality in military personnel, was dissolved and re-allocated to other PGs.

---

<sup>1</sup> DRDC uses a numbering convention for its S&T Program, where the first digit refers to the business line, the second digit refers to the partner group, and the third digit refers to the thrust.

### **3.1.2 Maritime**

The Maritime S&T Program identifies “specific objectives and activities to be pursued, and outputs to be produced for the Maritime Partner Group (PG 1). It also identifies the resources required to meet the S&T priorities established by the partners for ships, submarines and maritime aircraft, and their systems” (DRDC, 2008). The program is arranged in six thrusts:

- Above Water Warfare (11a),
- Maritime Command and Control (11b),
- Underwater Warfare (11c),
- Naval Platform Technology (11g),
- Maritime Domain Awareness (11h), and
- Integrated Maritime Decision Support (11i).

### **3.1.3 Land**

The Land S&T Program, also referred to as PG 2, provides “leadership and expertise to the Canadian Army and other stakeholders to define concepts, analyze options and develop capabilities for land operations. The program complements the forward-looking developments with support to the capabilities currently being acquired under capital equipment projects” (DRDC, 2008). The program is organized along six thrusts:

- Command (12o),
- Sense (12p),
- Act (12q),
- Shield (12r),
- Sustain (12s), and
- Integrated Analysis (12t).

### **3.1.4 Air**

The Air S&T Program (PG 3) supports the Canadian Air Force goals of “integrated CF operations at home and abroad by the discovery, development and integration of advanced sciences and technologies” (DRDC, 2008). In accordance with the air force functions terminology from the aerospace doctrine, the program is delivered through six thrusts:

- Sense (13m),
- Shape (13n),
- Move (13o),
- Sustain (13p),
- Command (13q), and
- Analyze (13r).

### **3.1.5 Personnel**

The Personnel S&T Program, also referred to as PG 4, is designed to provide “scientifically valid advancements in HR and social science knowledge in areas that substantially benefit DND and the CF in the pursuit of operational tasks and missions or departmental priorities today and in the future” (DRDC, 2008). It recently incorporated the medical intervention research activities previously done under PG 6. The Personnel S&T Program is now executed through five thrusts:

- Plan, Recruit, Train, Educate and Career Manage (14a),
- Prepare, Support, Honour and Recognize (14b),
- Individual, Operational and Organizational Effectiveness (14c),
- Human Integration (14d), and
- Medical Intervention (14e).

### **3.1.6 C4ISR**

The C4ISR S&T Program, otherwise known as PG 5, “supports the joint and national-level commander and staff, fulfilling the roles outlined by the Defence Planning, Reporting and Accountability Structure. Its scope includes work on communications, information and knowledge management, information architecture and information technology, information operations, national-level and joint command and control, surveillance, intelligence and space” (DRDC, 2008). The C4ISR S&T Program comprises five thrusts:

- Command and Control (15a),
- Communication and Computer Network Operations (15b),
- Intelligence (15d),



- Surveillance and Space (15e), and
- Scientific and Technical Intelligence Support and Advice (15e).

## 3.2 DRDC S&T Program Delivery

### 3.2.1 DRDC Centres

According to the *DRDC Annual Report for 2007 – 2008* (DRDC, 2008), DRDC is made up of eight research centres – “each with a unique combination of expertise and facilities to carry out world-class S&T”:

- **Defence R&D Canada — Atlantic.** DRDC Atlantic has “world-leading expertise in antisubmarine warfare, mine and torpedo defence, air and naval platform technology, maritime information systems, emerging materials and signature management” (DRDC, 2008).
- **Defence R&D Canada — Ottawa.** DRDC Ottawa is a “centre of expertise for radio frequency communications, sensing and electronic warfare; space systems; network information operations; synthetic environments; and radiological defence” (DRDC, 2008).
- **Defence R&D Canada — Suffield.** DRDC Suffield has “long been active in the development of effective defensive countermeasures against the threat of chemical and biological weapons. DRDC Suffield also has important programs of work in military engineering and artificial intelligence systems. The Counter Terrorism Technology Centre is co-located with and supported by DRDC Suffield and specializes in live agent training and chemical/biological testing and evaluation” (DRDC, 2008).
- **Defence R&D Canada — Toronto.** DRDC Toronto is “Canada’s centre of excellence for human effectiveness S&T in the defence and national security environment. Using a systems-based approach, the Centre covers all aspects of human performance and effectiveness, including individual and team performance, human-machine interaction and the influence of culture on operational effectiveness. DRDC Toronto also supports the operational needs of the CF through research, advice, test and evaluation, and training in the undersea and aerospace environments” (DRDC, 2008).
- **Defence R&D Canada — Valcartier.** DRDC Valcartier is “the main facility for combat, optronics and information systems. The centre is renowned for its leading-edge work performed through many bilateral and multilateral alliances and under North Atlantic Treaty Organization (NATO) agreements” (DRDC, 2008).
- **Defence R&D Canada — Centre for Operational Research and Analysis (CORA).** DRDC CORA is “the centre of excellence for operational research and the

prime delivery center for decision support to the CF/DND. Its efforts span force development, resource allocation, acquisition, improved operational effectiveness and efficiency, strategic analysis, scientific and technical intelligence, and the achievement of departmental policy and human resource goals” (DRDC, 2008).

- **Defence R&D Canada — Centre for Security Science (CSS).** DRDC CSS provides “S&T services and support to Public Safety Canada to address national public safety and security objectives. DRDC CSS also manages the Chemical, Biological, Radiological-Nuclear and Explosives Research and Technology Initiative, the Public Security Technical Program and the Canadian Police Research Centre” (DRDC, 2008).
- **Defence R&D Canada – Director General Military Personnel Research and Analysis (DGMPRA).** DGMPRA provides key CF/DND research capabilities in the areas of social science research, selection and assessment, quantitative and qualitative methods, (e.g. surveys and focus groups), workforce modelling and forecasting, concept development, and strategic analysis.

### 3.2.2 S&T Delivery Mechanisms

The DRDC S&T Program is delivered through two interconnected mechanisms: the Applied Research Program and the Technology Demonstration Program (TDP). There are also two additional programs designed to fund smaller projects: the Technology Investment Fund (TIF), which provides funding to DRDC scientists, and the Defence Industrial Research Program, which supports partnerships with Canadian industry. Projects in each of these programs span the range of the six partner groups, according to the *DRDC Annual Report for 2007 – 2008* (DRDC, 2008).

- The Applied Research Program is DRDC’s main research and development program. Its objective is “to advance the knowledge base of defence science, investigate novel and emerging technologies, and explore the military application of those technologies within the CF” (DRDC, 2008).
- The TDP demonstrates technologies fostered by DRDC and Canadian industry in the context of “real and potential future CF capabilities, concepts, doctrine, operations and equipment. The TDP is aimed at concept development and evaluation for force design purposes and is therefore typically not focussed on hardware development” (DRDC, 2008).
- The TIF supports “forward-looking, high risk – but potentially high payoff – research projects to ensure a dynamic DRDC technology portfolio consistent with the *Defence S&T Strategy* (DRDC, 2006), which will lead to important new in-house competencies” (DRDC, 2008).
- The Defence Industrial Research Program “strengthens and supports the Canadian defence industrial base through the provision of financial and scientific support for eligible industry-initiated research projects relevant to the defence of Canada and/or

its allies. The objective is to stimulate research and innovation to enhance Canada's ability to share in the development of technologies to meet Canadian, NATO and other allied defence requirements" (DRDC, 2008).

### **3.3 Maritime Research Plan**

The Navy has identified in the *Maritime Commander's Intent for 2009 to 2012* (MARCOM, 2008a) how it expects S&T to play a role in terms of the Navy succeeding in operations tomorrow. By FY 12/13, it is envisaged that "significant scientific progress will have been made, amongst other areas, in developing the information architectures required for maritime domain awareness in Canada's three-ocean maritime estate" (MARCOM, 2008a). It is also expected that "a technology watch will be maintained throughout the planning period in the Navy's core warfare disciplines, including S&T support for assessing trends and drivers in maritime aspects of the future security environment", and that "the maritime research program will continue to sponsor ongoing work in support of future fleet structure and sizing studies (Fleet Mix Studies), to develop comprehensive strategic HR planning tools, as well as to devise an improved model for readiness monitoring and reporting" (MARCOM, 2008a). However, as will be discussed below, when one looks at the personnel research being conducted by DRDC, DRDC is engaged in far more than just developing comprehensive strategic HR planning tools for the Navy.

### **3.4 Personnel Research Being Conducted by DRDC**

Research related to personnel can be found across most of the DRDC S&T Program. Whereas the predominance of the research is contained under PG 4 (Personnel), almost all of the other PGs also have at least a few personnel research activities. This is important to remember, for although the Navy does have some personnel research activities being conducted specifically for the maritime environment, there is a substantial amount of other personnel research that could be leveraged.

#### **3.4.1 Types of Personnel Research**

Personnel research encompasses a broad range of subject areas, including HR management, social sciences, and human factors.

##### **3.4.1.1 Research Related to HR Management**

HR management is an increasingly broad field that refers to managing "human capital", the people of an organization. The field has moved from a traditionally administrative function to a strategic one that recognizes the link between talented, engaged people and organizational success. HR management encompasses many key functions, including: recruitment and selection, training and development, performance evaluation, career management, compensation, industrial and employee relations, etc. (Wikipedia, 2009).

Typically drawing upon concepts developed in Industrial/Organizational Psychology and System Theory, research related to HR management that is conducted within DRDC is predominantly carried out by DGMPPRA.

#### **3.4.1.2 Social Science Research**

Social science research studies social groups, and more generally, human society, through a number of different disciplines. For example, anthropology provides a holistic account of humans and human nature. Economics is a social science that seeks to analyze and describe the production, distribution and consumption of wealth. Human geography focuses on fields as diverse as cultural geography, transportation, health, military operations, and cities. Psychology is an academic and applied field involving the study of behaviour and mental processes. Sociology is the study of society and human social action; it generally concerns itself with the social rules and processes that bind and separate people not only as individuals, but as members of associations, groups, communities and institutions, and includes the examination of the organization and development of human social life (Wikipedia, 2009). DGMPPRA again is responsible for most of the social science research conducted within DRDC.

#### **3.4.1.3 Human Factors Research**

In general, a human factor (HF) is a physical or cognitive property of an individual or social behaviour that is specific to humans, which influences the functioning of technological systems as well as human-environment equilibriums. HF research involves the study of all aspects of the way humans relate to the world around them, with the aim of improving operational performance and safety, through life costs and/or the improvement in the experience of the end user. Specializations within this field include cognitive ergonomics, usability, human computer/human machine interaction, and user experience engineering. New terms in this field are generated all the time, but despite the name changes, HF professionals share an underlying vision that through the application of an understanding of HF, the design of equipment, systems and working methods will be improved, directly affecting people's lives for the better (Wikipedia, 2009). Although DRDC Toronto conducts most of the HF research within DRDC, DRDC Atlantic, Ottawa and Valcartier have also been involved in this type of research for the Navy.

#### **3.4.2 Research Activity Directly Related to Naval Personnel**

There are roughly 25 research activities, under the auspices of the DRDC S&T Program, that are either currently being conducted, or are planned to be conducted, for the Navy in 2010, which are directly related to naval personnel issues. Over one third of the activities are focussed on human factors (see Table 1). Other areas being researched include: selection tests and standards (five activities), operational readiness (four), strategic HR management (three), attraction and recruiting (two), retention (one), and occupational analysis (one). The number of research activities has increased significantly over the last year, from 16 in 2009 to

the 26 planned for this year. Further details concerning each activity's status, expected end date, project manager, delivery centre, and objective can be found in Annex B.

**Table 1: DRDC S&T Activities Directly Related to Naval Personnel Issues<sup>2</sup>**

Research Area	S&T Project	S&T Activity
Attraction & Recruiting	Attraction, Selection and Recruiting (Recruiting – 14an03)	Navy Recruitment Study (14an03-3)
	Geographic Information System (GIS) (Methodology Development – 14cn03)	Post Great Lakes Deployment Report (14cn03-3)
Selection Tests & Standards	Attraction, Selection and Recruiting (Selection Test and Standards – 14an02)	CF Selection Standards (14an02-1) (MARS Officer and Clearance Diver MOCs)
		Submariner Selection (14an02-6)
		Evaluation of the Logistics Departmental Coord in HMCS Ships (14an02-8)
		NOAB Evaluation and Validation (14an02-12)
		MOST Analysis and Validation (14an02-19)
Occupational Analysis	Human Resource Planning (Occupational Level – 14ar02)	MAR ENG Military Employment Structure and Implementation Plan (14ar02-5) (NEW)
Operational Readiness	Operational Effectiveness (Human Dimension Assessment In Garrison – 14cj01)	Navy Unit Morale Profile (UMP) Strategic Analyses (14cj01-6) (NEW)
		UMP Analysis (CFNES) (14cj01-15) (NEW)
		UMP Analysis (CMSHQ) (14cj01-16) (NEW)
		UMP Analysis (ADAC(A)) (14cj01-19) (NEW)
Retention	Retention and Release (Retention – 14aq01)	Navy Retention Project (14aq01-6) (NEW)
Strategic HR Management	Human Resource Planning (Strategic Level – 14ar01)	Transition to the Future Fleet (14ar01-7) (NEW)
		Strategic Analyses of Naval HR Issues (14ar01-8) (used to be 11ia04)

<sup>2</sup> For the purposes of this study, a snapshot of the DRDC S&T Program was taken from the Collaborative Planning and Management Environment (CPME) in February 2010.

**Table 1: DRDC S&T Activities Directly Related to Naval Personnel Issues (cont.)**

Strategic HR Management (cont.)	Human Resource Planning (Database Support – 14ar05)	Ad Hoc Workforce Modelling and Statistical Analysis (Female Naval Officer Trends, Navy Training Requirements) (14ar05-2)
Human Factors	Above Water Warfare (11a)	Joint Fire Support TDP (11af)
	Maritime Command and Control (11b)	VICTORIA Class Submarine C3 Human System Integration Optimization (11ba)
	Underwater Warfare (Enabling CF Multi-Static Sonar – 11ca)	Operator Workload Reduction and Efficiency (11ca04)
	Underwater Warfare (Underwater Intervention in SW/VSW Operations – 11ci)	Human Machine Interface (11ci03)
	Naval Platform Technology (Direct Client Support – CSC Naval Platform – 11gc)	Crewing Optimization and Damage Control (11gc01)
	Naval Platform Technology (Simulation of Naval Platform Systems – 11ge)	Simulation of Human Dynamics During Deck Operations (11ge03)
	Maritime Domain Awareness (11h)	Collaborative Knowledge Exploitation for Maritime Domain Awareness (11hg)
		Technologies for Trusted Maritime Situational Awareness (11hl)
		Maritime Domain Analysis Through Collaboration and Interactive Visualization (11hm)
	Human Integration (Support to Operations – 14dh)	Dry Suit Replacement Trial (14dh07)

### 3.4.3 Personnel Research Activity That Could Have Implications for the Navy

Much of the research activity in the DRDC S&T Program that concerns personnel issues is done in the context of the broader CF, rather than for a specific environment. However, findings and recommendations from these studies are likely to have implications for the Navy, in terms of both its military and civilian workforces. It is important to have an awareness of these studies, as the data is often collected in such a manner that results for the Navy could be obtained separately if required. There are currently over 70 S&T projects pertaining to personnel with almost 200 research activities that could be of interest to the Navy (see Table 2). With this amount of research, the Navy should be able to leverage a great deal of information to address its personnel issues. Further details concerning each activity's status, expected end date, project manager, delivery centre, and objective can be found in Annex C.

**Table 2: DRDC S&T Projects Pertaining to Personnel Issues That Could Have Implications for the Navy<sup>2</sup>**

Research Area	S&T Project (or Thrust)	Activity (or Project) Title
Attraction & Recruiting	Attraction (14an01)	Support to Canadian Forces Recruiting Group (CFRG) (14an01-1)
		National Occupation Code – Statistical Analysis (14an01-2 and 14cn03-3)
		Prospect Survey (14an01-3)
		Applicant Survey (14an01-4)
		Attracting the Best in S&T (14an01-5)
		Civilian Labour Market Research (14an01-6)
	Recruiting (14an03)	Optimal Location of Recruiting Centres (14an03-1)
		Recruitment Study (14an03-2)
		Visible Minorities Recruiting (14an03-4)
		Recruit Medical Screening Process (14an03-5) (NEW)
		Assessment of CF Strategies to Attract and Recruit Aboriginals and Visible Minorities (14an03-6) (NEW)
	Applicant Database (14an04)	Applicant Database Conversion (14an04-1)
	Assessment of Structures and Organization (14ck03)	CFRG Future Recruiting Concepts Environmental Scan (14ck03-2)
		Strategic Analysis of Attraction/Recruiting (14ck03-3)
Selection Tests & Standards	Selection Tests and Standards (14an02)	Army of Tomorrow Job Analysis (14an02-4)
		AEC Spatial Ability and Situational Awareness Testing (14an02-5)
		CF Instructor Attributes (14an02-7)
		Personality Testing (14an02-13)
		Biodata Measure (14an02-14)
		Executive Function Testing for Air Ops (14an02-15)
		Selection Standards for the ACSO Sub-Speciality: UAV Operator (14an02-23) (NEW)

**Table 2: DRDC S&T Projects Pertaining to Personnel Issues That Could Have Implications for the Navy (cont.)**

Selection Tests & Standards (cont.)	Future Selection Tests (14as02) and Technology (14as03)	CFAT Validation (14as02-1)
		COGSCREEN Predictive Validity Analysis (14as02-2)
		New Selection Test Technology (14as03-1)
Training & Education	Land Command (12o)	JIMP Essentials in the Public Domain: Implications for Training and Education for the Tactical Commander (12og)
	Accelerated Mission Specific Training (12sk)	Exploitation of Dynamic Learning (12sk02)
		Learning in Complex Systems (12sk03)
		Defining Complexity and Dynamic Decision Making in the CF (12sk04)
		Training in Dynamic Team Environments (12sk05)
		Cognition of Dynamic Decision Making (12sk06)
	Air Personnel and Force Generation (13re)	NFTC Optimal Course Loading & Student Throughput Capacity (13re01)
		Basic Air Navigation Course Resource Allocation Model Development (13re02)
	Basic Training List (14ao01)	BTL Analysis Using the Production Management Tool (PMT) (14ao01-1)
		Personnel Generation Performance Measurement (14ao01-2)
	Advanced Training (14ao02)	IT&E Strategy for Senior Leaders (Gap Analysis) (14ao02-1)
		AERE Post Graduate Training (14ao02-2)
	Education (14ao03)	Impact of SLT Removal from DP1 (14ao03-1)
	Learning Technologies (14ao04)	Evaluation of DND Mentoring Program (14ao04-1)
	Advanced E-Learning Technologies (14av)	Adaptive Learning and Intelligent Tutoring Technologies
	Diversity (14bl02)	Future Directions in Training and Commitment of EE Officers (14bl02-3)
	Alternate Dispute Resolution (ADR) (14bl03)	Awareness and Knowledge Transfer of ADR Training (14bl03-1)
	Team Effectiveness in Collaborative Operations (14cg)	Training Requirements (14cg04)



**Table 2: DRDC S&T Projects Pertaining to Personnel Issues That Could Have Implications for the Navy (cont.)**

Training & Education (cont.)	Alternative Training Delivery and CF Socialization: Impacts and Opportunities (14ch)	Alternate Training Delivery: Impact on Early Socialization of CF Members (14ch01)
	Interagency Trust (14ci)	Recommendations for CF/Interagency Training and Education Applications (14ci04)
		Integrating Lessons Learned into IT&E (14ci05)
	Psycho-Physiological Readiness (14da)	Stress Management Training in Virtual Reality (14da01)
	Capability Modelling, Simulation and Training (14df)	Collective Network Simulation (14df01)
		Simulated Operators for Networks (14df02)
		Sensory Cuing for Embedded and Deployed Training (14df03)
	Virtual Reality for Team Training (14dn)	Fused Reality Visual Display (14dn01)
		Simulated Operators for Networks (14dn02)
		Virtual Crewmember (14dn03)
	Training of Medical First Responders (14em)	Training of Civilian NBC First Responders (14em01)
		Training of Military NBC First Responders (14em02)
		Training of Military First Responders (Trauma Only) (14em03)
Retention and Attrition	Performance Appraisal (14ap01)	Promotion and Retention of Visible Minorities in the CF (14ap01-2)
	Retention (14aq01)	Retention of Regular Force by Transfer to Reserve Force (14aq01-1)
		ADM(HR-Civ) Exit Survey Pilot Study (14aq01-2)
		CF Exit Survey (14aq01-4)
		CF Retention Survey (14aq01-5)
		Retention Survey – Analysis for Support Occupations (14aq1-10) (NEW)
		Retention Survey – Other Analysis (14aq01-11) (NEW)
	Attrition (14aq02)	Attrition Forecast Methodology (14aq02-1)
		Attrition Reporting and Forecasting (14aq02-2)

**Table 2: DRDC S&T Projects Pertaining to Personnel Issues That Could Have Implications for the Navy (cont.)**

Retention and Attrition (cont.)	Attrition (14aq02) (cont.)	Impact of TFA on Attrition (14aq02-3)
		Ad Hoc Attrition and Retention Analysis (14aq02-4)
		BMQ Attrition Analysis (14aq02-5)
		Attrition in the Civilian Workforce: A 10 Year Overview of Attrition Data and Forecasting Trends (14aq02-6) (NEW)
	Measurement and Reporting (14aq03)	Annual Report on CF Attrition (14aq03-1)
Career Management	Performance Appraisal (14ap01)	CFPAS Replacement Project (14ap01-1)
	Career Manage and Employ (Succession Planning – 14ap02)	Standardization of Succession Planning Initiatives (14ap02-1)
Morale and Welfare	Casualty Support (14bk02) and Post Deployment Reintegration (PDR) in Injured CF Personnel (14cb06)	Care of the Ill and the Injured – Survey and Follow-on Research (14bk02-2)
		Injury Surveillance (14bk02-3)
		Care of Ill and Injured CF Personnel (14bk02-4) (NEW)
		PDR in Injured CF Personnel (14cb06-1)
	Transition (14bk03)	VAC/DND Transition Study (14bk03-1)
	Family (14bk04)	CF Individual Accommodation Study (14bk04-3)
		Economic Impact and Determinants of Military Life on Spousal Employment (14bk04-5)
		Childcare and Caregiver Study (14bk04-6)
		Collaboration with US Deployment Health Research Center (14bk04-7)
		Imposed Restriction: The Impact on Families (14bk04-8)
		Second Administration of Spousal Quality of Life Survey (14bk04-9)
		Well-Being of Reservists' Families (14bk04-10)
	Compensation and Benefits (14bk05)	Strategic Assessment of Compensation and Benefits/Total Rewards Model (14bk05-1)
		Impact of Compensation and Benefits on Recruiting and Retention (14bk05-2)

**Table 2: DRDC S&T Projects Pertaining to Personnel Issues That Could Have Implications for the Navy (cont.)**

Morale and Welfare (cont.)	Compensation and Benefits (14bk05) (cont.)	Evaluation of the Pension Program (14bk05-3)
		International Benchmarking (14bk05-4)
		Evaluation of the CF IRP (14bk05-5)
		Adequacy of PTE/LT Salaries in High Cost of Living Areas (14bk05-6) (NEW)
		Long Term Impact of IR on CF Personnel and Families (14bk05-7) (NEW)
	The Social Contract (14bk06)	Community Wellness (14bk06-1) (NEW)
		Duty to Care (14bk06-2) (NEW)
		The Benefits of the CF Recreation Program (14bk06-3) (NEW)
	Official Languages (14bl01)	Official Languages Program Transformation Model Survey (14bl01-1)
	Diversity (14bl02)	EE Monitoring for ADM(HR-Civ) (14bl02-2)
		Civilian EE Employment Systems Review (14bl02-4)
		Civilian Diversity Climate Survey (14bl02-5)
	Alternate Dispute Resolution (ADR) (14bl03)	Performance Measurement Study on ADR (14bl03-2)
		Effectiveness of Harassment Policy (14bl03-3) (NEW)
Health and Fitness	Health (14bj01)	Blind Drug Testing (14bj01-1)
		Pan CF Random Drug Testing (14bj01-2)
		Personality and Psychological Well-Being of New Recruits (14bj01-3)
		Recruit Health Questionnaire (14bj01-4)
		Health and Lifestyle Survey (14bj01-5)
		Mental Health and Stigma in the CF (14bj01-6)
		Deployment Characteristics Related to Post-Deployment Mental Health Outcomes (14bj01-7) (NEW)

**Table 2: DRDC S&T Projects Pertaining to Personnel Issues That Could Have Implications for the Navy (cont.)**

Health and Fitness (cont.)	Health (14bj01) (cont.)	Psychological Well-Being in the CF (14bj01-8) (NEW)
		Risk-Taking Propensity and Behaviour in CF Recruits and Implications for Their Military Career (14bj01-9) (NEW)
	Fitness (14bj02)	Conceptual Model for Health and Fitness (14bj02-1)
		Participation in the CF Sports Program (14bj02-2) (NEW)
	Spiritual (14bj03)	Servant Leadership (14bj03-1)
		Spiritual and Social Well-Being (14bj03-3)
Operational Readiness	International Logistics Readiness and Mobility (10bi)	Redeployment Planning and Simulation Model (10bi02)
		HR Operational Sustainment Model (10bi03)
	Stress and Small Unit Operations (12qo)	Impact of Multiple Physiological and Psychological Stresses on Individual and Team Performance (12qo02)
	Air Sustain (13p)	Circadian Entrainment to Counter Jet Lag and Shift Work (13pf)
	Air Command (13q)	Human Dimension of the Expeditionary Air Force (13qf)
	Sustainment (14ap04)	Readiness and Sustainment Modelling and Analysis (14ap04-1)
	Perstempo/Optempo (14bk01)	Deployment Policies/Practices Across TTCP Nations (14bk01-1)
	Psychological Resiliency (14cb)	Resiliency After Capture (14cb02)
		PDR Adaptation (14cb04)
		HLTA Experiences (14cb05)
		Adaptation in Augmentees (14cb07)
	Team Effectiveness in Collaborative Operations (14cg)	Factors Underpinning Role Adoption and Team Mental Models (14cg02)
		Effectiveness in the Operational Readiness Envelope (14cg03)
	Human Dimension in Operations (HDO) Assessment (14cj02)	HDO Survey for Small Missions (14cj02-2)
		Development and Validation of an International HDO Model (14cj02-7)

**Table 2: DRDC S&T Projects Pertaining to Personnel Issues That Could Have Implications for the Navy (cont.)**

Operational Readiness (cont.)	Human Dimension in Operations (HDO) Assessment (14cj02) (cont.)	Mediating Effect of Trouble/Concern on Relationship Between Stress and Strain (14cj02-10)
		Attitudes Towards Length of Pre-Deployment Training and Length of Tour (14cj02-11)
		Effect of Operations in Afghanistan on Career Intentions (14cj02-12) (NEW)
		Effect of Operations in Afghanistan on Organizational Commitment (14cj02-13) (NEW)
		Examination of Strain Across the Deployment Cycle (14cj02-14) (NEW)
		Unit Climate Profile – 2 <sup>nd</sup> Generation Development and Validation (14cj02-20)
		Validation of K-10 Strain Risk Categories within TFA Populations (14cj02-21)
		The Effects of Cynicism in HDO Survey Responses (14cj02-23)
		Understanding Morale Climate Scale Results (14cj02-24)
	Psycho-Physiological Readiness (14da)	Individual Readiness Model (14da02)
	Operational Pharmacology (14db)	Operational Stress and Neuro-Cognitive Impairments (14db01)
	Integration with CMP Issues (14de)	Modelling Team Performance (14de01)
		Moral and Ethical Dilemmas in CF Operations (14de02)
	Support to Operations – Human Integration (14dh)	HF Support to UAVs (14dh01)
	Human Effectiveness in Sustained Operations and Adverse Environments (14dm)	Predictive Frameworks for Fatigue (14dm01)
		Mathematical Modelling of Fatigue (14dm02)
		Fatigue Countermeasures (14dm03)
	Command and Control (15a)	Enhanced CF Influence Operations (15ag)
	Intelligence (15d)	Understanding and Augmenting Human Analytical Capabilities (15dm)

**Table 2: DRDC S&T Projects Pertaining to Personnel Issues That Could Have Implications for the Navy (cont.)**

Recognition	Honour and Recognize (14bm)	What Forms of Recognition Are Important Today (14bm02-1)
Strategic HR Analysis	HR Planning (Strategic Level) (14ar01)	Aging of the CF Workforce (14ar01-03)
	Cultural Intelligence, Command Leadership and War (14ca)	Cultural Intelligence (14ca01-1)
		Warrior Culture and Soldier Identity (14ca01-4)
		CF Leader Development (14ca02)
	Assessment of Structures and Organizations (14ck03)	Implications of Neo-Capital Theories on HR Management in the CF (14ck03-5)
Organizational Effectiveness	Interacting Organizations (10af)	Psycho-Social Factors SAS Panel (10af04)
		TIF Modelling Meta-Organization Collaboration and Decision-Making (10af07)
	Air Personnel and Force Generation (13re)	Special Operations Aviation and Selection Criteria and Process (13re03)
	HR Planning (Strategic Level) (14ar01)	CAS Establishment Study (14ar01-5)
	HR Planning (Occupational Level) (14ar02)	CF Force and Occupational Structure Modelling and Analysis (14ar02-2)
		Special Personnel Qualification Requirements (SPQR) Research Project (14ar02-9) (NEW)
	HR Planning (Organizational Level) (14ar03)	Assessing Establishment Requirements for Canada Command HQ (14ar03-1)
	Cultural Intelligence, Command Leadership and War (14ca)	Army Culture Survey (14ca01-2)
	Interagency Trust (14ci)	Integrative Literature Reviews and Conceptual Model Design of Interagency Trust (14ci01)
		SME Feedback and Lessons Learned Integration/Development of Interagency Trust (14ci02)
	Organizational Influence (14cj03)	Fmn 2021 Functional Analysis (14cj03-1)
		Functional Job Analysis of Key HQ Positions (14cj03-3)
		AoT Fmn 2021 Study (14cj03-6)

**Table 2: DRDC S&T Projects Pertaining to Personnel Issues That Could Have Implications for the Navy (cont.)**

Organizational Effectiveness (cont.)	Assessment of Policy (14ck01)	Your Say Surveys (14ck01-1, 14ck01-2, 14ck01-3, 14ck01-4, 14ck01-5, 14ck01-7)
		Defence Ethics Survey (14ck01-8)
		Public Service Employee Survey (PSES) (14ck01-11) (NEW)
	Developing a CF Portrait (14cl)	Primary Reserve Project (14cl03-1)
		CF Primary Reserve Continuous Attitude Survey (14ck03-3) (NEW)
		Military-Civilian Work Culture and Relations ((14ck03-4) (NEW)
	Virtual Social Networking (14dl)	Web-Based Technology Installation and Support (14dl01)
		Requirements/Gap Analysis (14dl02)
		Virtual Social Networking and Distributed Teams (14dl03)
		Evaluating Web-Based Support Tools for Virtual Social Networking (14dl04)
HR Modelling & Analysis	Land Integrated Analysis (12t)	Force Generation and Sustainment (12ta)
	Future Air Capability Options (13rb)	Air Force Personnel Transition Modelling Study (13rb15)
	Air Personnel and Force Generation (13re)	PARSim Modifications to Support Acquisition of New Aircraft Fleets (13re04)
	Plan, Recruit, Train, Educate and Career Manage (14a)	Right Person, Right Qualification, Right Place, Right Time (R4) HR TDP (14al)
	HR Planning (Strategic Level) (14ar01)	Force Generation Modelling and Analysis (14ar01-1)
		Force Structure Review (14ar01-2)
		Reg F Personnel Reporting (14ar01-4)
		Multi-Disciplinary Methods (14ar01-6)
	HR Planning (Occupational Level) (14ar02)	Annual Military Occupational Reviews (14ar02-1)
		Civilian Workforce Modelling and Analysis (14ar02-3)
	Database Support (14ar05)	Build and Maintain Internal Historical Databases (14ar05-1)
		Ad Hoc Workforce Modelling and Statistical Analysis (14ar05-2)

**Table 2: DRDC S&T Projects Pertaining to Personnel Issues That Could Have Implications for the Navy (cont.)**

HR Modelling & Analysis (cont.)	Developing a CF Portrait (14cl)	Data Definition and Capture (14cl01-2)
	Primary Data Collection (14cm)	Survey Management (14cm01)
		Partnerships (14cm03)
	Geographic Information System (14cn)	Environmental Scan Summary Report (14cn03-5)
		Partnerships (14cn04-1)
	Modelling and Simulation for Option Analysis and Requirements Engineering (14dj)	Manning Requirements Analysis: A Scoping Study (14dj02)
	Modelling and Simulation for Option Analysis and Requirements Engineering (14dj) (cont.)	A Software Solution for Integrated Options Analysis and Requirements Engineering (14dj03)

#### **3.4.4 Other Research Activity That Could Have Personnel Implications**

By taking an even broader perspective, other parts of the DRDC S&T Program may also bear relevance to naval personnel. When looking at concepts or capabilities that are currently in the developmental stage, ramifications for various parts of the personnel system, from attraction and recruiting, to training, to morale and welfare factors etc. need to be considered. Consequently, virtually all of the PG 1 (Maritime) program, aside from those projects already identified, should be monitored for possible personnel implications. For example, if a new piece of equipment is being developed for a ship or submarine, it would have to be considered if the right people and skill sets are being recruited to use that equipment effectively, if the training system needs to change to accommodate it, if naval personnel need to be additionally compensated, and so forth. It is easier to deal with such issues during the developmental stages, rather than having to deal with them as an after-thought.

There are currently over 80 S&T projects that could be of interest to the Navy from a conceptual or capability perspective (see Table 3). Hazard protection and medical intervention research are also included in this discussion. Whereas it could be argued that these types of research should be included in Annex C since they more directly impact personnel, either from a threat or protection perspective, results from these areas are more the concern of Canadian Forces Health Services (CFHS) and are not likely to impact the Navy's personnel system per se. For the purposes of this study, they are considered more a capability, much like equipment that is being developed for future naval platforms. Further details concerning each activity's status, expected end date, project manager, delivery centre, and objective can be found in Annex D.



**Table 3: Other DRDC S&T Projects That Could Have Personnel Implications<sup>2</sup>**

<b>S&amp;T Program</b>	<b>S&amp;T Thrust</b>	<b>Project Title</b>
Integrated Capabilities for DND/CF	Strategic and Future Environment (10a)	Scenario Development, Scanning and Analysis (10ab)
	Operations Analysis and Integrated Solutions (10b)	Support to Major Capital Projects and Life Cycling Costing Analysis (10bg)
	Hazard Protection (10d)	There are 12 projects pertaining to Hazard Protection.
Maritime	Above Water (11a)	There are 11 Above Water projects.
	Maritime Command and Control (11b)	There are 8 Maritime Command and Control projects.
	Underwater Warfare (11c)	There are 17 Underwater Warfare projects.
	Naval Platform Technology (11d)	There are 9 Naval Platform projects.
	Maritime Domain Awareness (11h)	There are 4 Maritime Domain Awareness projects.
	Integrated Maritime Decision Support (11i)	There are 3 Integrated Maritime Decision Support projects.
Land	Land Command (12o)	Situational Analysis of Tactical Army Commanders (12of)
		Auditory Overload in CF Land Operations (12oi)
Air	Air Sustain (13p)	Air Crew Neck Strain Mitigation (13pg)
Personnel	Human Integration (14d)	Human Centric Architecture Framework (Human Views Development (14dd)
Medical Issues	Human Integration (Environmental Health Mitigations – 14dc)	Monitoring of Water Contamination for Diving Operations (14dc01)
	Medical Intervention (14e)	There are 15 projects pertaining to Medical Intervention.
C4ISR	Command and Control (15a)	Multi-Level Execution Monitoring (15ab)

### 3.5 Summary

As outlined above, there are a multitude of research activities being conducted by DRDC that could have implications for naval personnel and/or the Navy's HR system, either directly or indirectly. Questions remain, however, as to whether or not these activities are actually aimed at addressing the Navy's most urgent HR deficiencies and what other research activities should be undertaken to increase the flexibility and capacity of the Navy's military and civilian workforces, both today and in the future. This will be discussed in the next chapter.

## 4. Gap Analysis

---

This chapter outlines various research opportunities that could in part, or in whole, help to address the key issues outlined in the *Maritime Commander's Intent for 2009 to 2012* (MARCOM, 2008a) and the *MARCOM Strategic Assessment for 2009* (MARCOM, 2008b), and provide analytical support to the current activities outlined in the *CMS Strategic HR Campaign Plan* (DGMPR, 2009a). These proposed research initiatives span all three time horizons, encompass tactical and strategic level issues, and entail a mix of analytical tools, ranging from focus groups and interviews, surveys, historical databases, modelling and forecasting, to strategic analyses. Whereas a number of these ideas have been previously outlined in Dunn (2008), others have been added to address the specific lines of operation currently being used in the *CMS Strategic HR Campaign Plan* (DGMPR, 2009a). Effort has also been taken to identify research currently being conducted for other organizations that could be leveraged for the Navy.

### 4.1 Attraction, Recruiting & Selection

#### 4.1.1 Attraction and Recruiting

There are two research activities that are currently supporting the Navy's efforts in attraction and recruitment:

- **Navy Recruitment Study (14an03-3).** The objective of this study is to assess factors of relevance to the Navy in relation to attraction and recruitment of personnel, such as why people join the Navy, using existing data sources, such as the Prospect Survey (14an01-03) and the Applicant Survey (14an01-04), as well as focus groups.
- **Post Great Lakes Deployment Report (14cn03-3).** The objective of this study is to use the Geographic Information System (GIS) capability to tie socio-demographic information to the addresses of visitors during the Great Lakes Deployment.

Clearly more research could be conducted to support the Navy's efforts to address its attraction and recruitment challenges, especially considering the number of activities within the *CMS Strategic HR Campaign Plan* (DGMPR, 2009a). Potential studies include:

- **Tapping into the Applicant Pool.** Once it has been determined who is applying to the Navy and why, research should be conducted as to how to effectively reach out to the untapped applicant pool, i.e. those who are not applying to the Navy, with emphasis being placed on those who have the skill sets that the Navy requires, rather than just simply numbers. For example, Item A3 under the *CMS Strategic HR Campaign Plan* (DGMPR, 2009a) targets attraction activities on depressed communities. Whereas it cannot be argued that this segment of the population is

likely interested in gainful employment, does it necessarily have the skill sets and attributes that the Navy wants and needs, particularly for its future fleet?

There are several studies that are currently being undertaken by DRDC, which may be of interest in terms of reaching out to the untapped applicant pool. One study is looking at National Occupation Codes (14an01-2), which will provide a location analysis of 20 specific occupations to support ADM(HR-Civ) in recruiting particular types of skill sets that may also be of use to the Navy. There is another study looking at the optimal location for recruiting centres (14an03-1), which would also assist the Navy in potentially reaching the untapped pool. Another study is looking at how to attract the best in S&T (14an01-5), which may assist in the Navy's efforts to attract people into the technical trades, which are seriously undermanned at the present time. Another study is looking at the civilian labour market, reviewing labour market factors to determine potential risk areas to DND (14an01-6). Taking a more strategic perspective, there is also monitoring of the external environment to identify issues and situations that could affect strategic military personnel planning (14an01-1 and 14ck03-3).

- **Aboriginal and Visible Minority Recruiting.** Closer examination of visible minority and Aboriginal recruiting is also warranted. Given the future demographic trends, these are two largely untapped pools of potential applicants, with which the Navy needs to better connect. There is currently a DRDC study underway looking at visible minorities' perceptions of, and interest in, the CF (14an03-4), from which possible lessons learned could be drawn for the Navy. A new study has also just been added to the S&T Program which will assess the effectiveness of current CF strategies to attract and recruit Aboriginals and visible minorities (14an03-6).
- **Navy as an Employer of Choice.** Rather than using the more traditional approach of trying to entice people to enroll into the Navy through the use of recruitment bonuses, this study would examine what it would take to make the Navy an employer of choice and have people want to be part of the Navy. This would not only have attraction/recruitment ramifications, but it would also impact on other personnel management lines of operation, such as retention, compensation, etc. Currently there is nothing in the DRDC S&T Program that is directly related, but that being said, there may be some activity within Assistant Deputy Minister (Public Affairs) (ADM(PA)) that could be of assistance.
- **Market Research.** How should the Navy be attracting people? What are the best practices being utilized by other militaries and "employer of choice" companies? What messages should the Navy be sending out? How should the Navy be branded to better promote recruiting? The Navy is investing considerable resources into attraction activities, such as its Naval Display Buses that are being used across Canada, so it is important to use such tools as effectively as possible. Again, it would be worthwhile to consult with ADM(PA) to discuss this further to see if there is any related research, as there is nothing currently in the DRDC S&T Program.
- **Best Practices for Recruiting.** The best practices used in recruiting for other militaries and "employer of choice" companies could be researched to help facilitate

the reach out activities to be utilized by Navy recruiting teams. One DRDC study, which should be of assistance in this endeavour, is the Recruitment Study (14an03-2) that is examining individual differences associated with reasons for leaving the recruiting process and recruit quality. Another study currently being conducted on future recruiting concepts (14ck03-2) should also be of interest.

- **Navy Recruitment Bonuses.** This study would examine the effectiveness of recruitment bonuses for the Navy and determine possible alternative approaches through the examination of best practices used by other militaries and civilian organizations. In DRDC, a study is currently underway for the Director General Compensation and Benefits (DGCB), looking at the impact of compensation and benefits on recruitment and retention, which includes examination of recruitment bonuses (14bk05-2). Such a study could provide the foundation for a more specific analysis for the Navy.
- **Quality of New Recruits.** With considerable effort being spent on drawing in enough recruits to address the critical shortages in several of the Navy's occupations, a review of the quality of these recruits may be in order. Do they actually have the skills and attributes that the Navy requires? Is more time now required in the training system to bring these recruits up to the necessary standards? Are early attrition rates up? What is the impact on the rest of the Navy, in terms of how well these recruits interact with more experienced sailors? Five DRDC studies could provide some additional insight: Recruit Medical Screening Process (14an03-5), Basic Military Qualification (BMQ) Attrition Analysis (14aq02-5), Personality and Psychological Well-Being of New Recruits (14bj01-3), the Recruit Health Questionnaire (14bj01-4), and the Strategic Analyses of Naval HR Issues (14ar01-8) that is currently looking at the Millennial Generation.

#### 4.1.2 Selection

In addition to attraction and recruitment issues, issues concerning the selection of naval officers and NCMs need to be considered. Because the Navy cannot easily recruit candidates for lateral entry into middle or senior rank levels, Navy leadership candidates and technical specialists must be groomed from within. This limitation on lateral recruitment means that the future organizational effectiveness of the Navy is much more dependent than civilian organizations on the number, nature and quality of its basic recruits. Presently there are a number of research studies underway to address critical selection issues for the Navy. These studies include:

- **Maritime Officer Selection (14an02-1).** The objective of this study is to examine MARS Officer attributes and competencies and determine appropriate selection criteria.
- **Clearance Diver Selection (14an02-1).** The objective of this study is to examine Clearance Diver attributes and competencies and determine appropriate selection criteria.

- **Submariner Selection (14an02-6).** The objective of this study is to recommend assessment techniques and a selection system for submariner employment.
- **Evaluation of the Logistics Departmental Coord Function on HMC Ships (14an02-8).** The objective of this study is to determine critical attributes through the use of a job analysis.
- **Naval Officer Assessment Board (NOAB) Evaluation and Validation (14an02-12).** The objective of this study is to review the NOAB and conduct validation studies. Of particular concern is the current attrition rates, which need to be addressed.
- **Maritime Officer Selection Test (MOST) Analysis and Validation (14an02-19).** The objective of this study is to validate the MOST in predicting performance in MARS Phase Training.

There are also opportunities to expand on the selection tool set for the Navy, with DRDC studies currently evaluating the usefulness of new CF measures, such as spatial ability and situation awareness testing (14an02-5), personality testing (14an02-13), biodata measures (14an02-14), executive function testing (14an02-15) and cognitive screening (14as02-2). In addition, there is a study identifying new constructs that should be measured and the technologies/platforms required to administer selection tests (14as03-1). Research that is identifying soldier attributes and competencies related to the Army of Tomorrow (14an02-4) and selection standards for Unmanned Aerial Vehicle (UAV) operators (14an02-23) may also help the Navy determine what attributes and competencies it requires for the fleet of tomorrow. Findings from all of these projects would help guide the development of future naval personnel selection measures.

## 4.2 Training and Education

It is not uncommon for CF personnel to spend a quarter of their career undertaking IT&E and professional development. This represents a significant investment for both the CF and the service member. It is therefore critically important that investments in IT&E be efficient and effective. Accordingly, the *Maritime Commanders Intent for 2009 to 2012* (MARCOM, 2008a) has stated that the Navy training system needs to be retooled (see Section 2.3.2). Therefore, consideration should be given to undertaking the following research for the Navy, as there is currently no specific research being conducted for the Navy in this area:

- **Best Practices in Training and Education.** This study would identify the Navy's challenges in today's IT&E environment and the impact of training for the future fleet. It would examine best practices and upcoming technological developments to better deliver IT&E and professional development to naval personnel. Naval occupational training is two to three times as long as the average length in the CF (Dunn, 2008), and while this is explained due to the combination of in-class and on-the-job training (OJT) used for naval occupations, attention needs to be given to whether the length of training is having any negative impacts on career decisions or

satisfaction, and whether there are training alternatives that could shorten training times.

There are numerous research activities currently being conducted in DRDC which may be of assistance in examining training-related issues for the Navy: implications of Joint, Inter-agency, Multi-national, Public (JIMP) for training and education of tactical commanders (12og), accelerated mission specific training (12sk), course loading and throughput (13re01), course resource allocation model development (13re02), instructor attributes (14an02-7), the Basic Training List (BTL) pipeline (14ao01-1), IT&E for senior leaders (14ao02-1), post-graduate training (14ao02-2), the impact of removing second language training (SLT) from Development Period 1 (DP1) (14ao03-1), learning technologies (14ao04), advanced e-learning technologies (14av), future directions in EE officer training (14bl02-3), knowledge transfer of alternate dispute resolution (ADR) training (14bl03-1), training requirements for team effectiveness in collaborative operations (14cg), the impact of alternative training delivery on CF socialization (14ch), training related to interagency trust (14ci), stress management training in virtual reality (VR) (14da01), capability modelling, simulation, and training (14df), virtual reality for team training (14dn), and training of medical first responders (14em).

- **Training Failure Rates.** There are also concerns regarding reports of high training failure rates in some naval occupations. This is not presently being researched, so this needs to be explored further as to the validity of the observation, and if it is the case, the causes and the possible ways of reducing the failure rates need to be examined. Some of the DRDC studies on attrition may provide some additional insight, such as: ad hoc attrition and retention analyses (14aq02-4) and BMQ attrition analysis (14aq02-5), as well as the analysis of the BTL pipeline (14ao01-1).

### 4.3 Occupational Management

A recently acquired HR modeling capability for the Navy has been used to begin some preliminary analysis of the MARS officer production pipeline, looking at attrition from enrolment to the Operational Functioning Point (OFP). However, there are currently no other research activities being conducted for the Navy in support of the occupation management line of operation. To address some of the occupational management issues identified in the *CMS Strategic HR Campaign Plan* (DGMPR, 2009a), the following types of research could be undertaken:

- **Annual Military Occupational Review (AMOR) Analyses.** Personnel statistics are presently being provided to the Navy only on an as-requested basis. A more structured approach to occupational analyses could be taken to ensure that the Navy is working with consistent and reliable data. DRDC has a number of research activities, such as AMOR Support (14ar02-1), CF Force and Occupational Structure Modelling and Analysis (14ar02-2) and Civilian Workforce Modelling and Analysis (14ar02-3), which utilize HR modelling capabilities that could be of assistance.

- **Chronic Shortages.** The underlying reasons for the chronic personnel shortages in the Navy need to be identified, with proposals made to address the causes. What are the characteristics of those naval occupations currently in the “red” category that are lending themselves to not attract and retain personnel? There is presently no research activity within DRDC that would be of assistance in this endeavour.
- **Mapping of Navy Workforce.** Given demographic trends, such as the aging of the CF workforce (14ar01-3), which are in turn aggravated by the low propensity of Canadians to join the Navy, research needs to be undertaken to strategically map the Navy workforce (both military and civilian) across different time horizons. For example, are today’s distressed trades going to be tomorrow’s distressed trades? Such research would allow the Navy to anticipate any potential shortcomings and assist it in strategic recruitment/retention efforts.
- **Sustainment of the Navy.** A related issue that could be addressed by HR modelling is whether the Navy can sustain its optempo with its current resources, or does it need to expand? Sustainment issues for the Army and Air Force are currently being analyzed by DRDC under activities such as: HR Operational Sustainment Model (10bi03), Readiness and Sustainment Modelling and Analysis (14ap04-1), and Land Force Generation and Sustainment (12ta). These activities could provide lessons learned and/or analytical tools that the Navy could leverage to examine its own issues related to sustainment.
- **Force Structure.** A Force Structure Review is currently being undertaken by the Navy in conjunction with the CF Force Structure Review. Modelling and analysis again could support such a requirement. Three studies are being undertaken by DRDC, which could provide analytical tools and possibly lessons learned: Force Structure Review (14ar01-2), Chief of Air Staff (CAS) Establishment Study (14ar01-5), and Assessing Establishment Requirements for Canada Command Headquarters (HQ) (14ar03-1).
- **Transitioning from the Fleet of Today to the Fleet of Tomorrow.** As the Navy is about to enter a transition period where the fleet of today will be replaced by the fleet of tomorrow over the next decade, questions naturally arise with regards to how to transition the people as well as the equipment. Again modelling and analysis can assist in offering insights into such critical questions for the Navy, and a new research activity has been added to the DRDC S&T Program for 2010 to look at such issues, Transition to the Future Fleet (14ar01-7). DRDC is also currently conducting two other studies for the Air Force to similarly assist them in their transitions, which might provide additional insight: Air Force Personnel Transition Modelling (13rb15) and Modifications to the Production, Absorption, Retention Simulation (PARSim) to Support Acquisition of New Aircraft Fleets (13re04).

## 4.4 Morale and Welfare

Most members of the CF understand that there are times when the needs of the military have to prevail over theirs; this was the explicit commitment upon enrolment. However, over time, with added seniority and changes in individual needs, there is a potential for dissatisfaction to grow if personnel do not perceive that the organization is doing what it can, in a fair manner, to make reasonable accommodation to factor in their needs.

Currently there is no research being done to look at morale and welfare issues from a Navy perspective. Research activities could therefore include the following:

- **Issues of Discontent.** There is apparently some discontent among some of the technical specialist NCM occupations for reasons related to their employment (Dunn, 2008). For example, the Navy has customarily asked all sailors to share in housekeeping tasks onboard ship. Some newer generation sailors have expressed frustration with this policy, feeling that their employment should be aligned with their training. There is also some frustration among specialist technicians because of the narrow opportunities they are afforded to use their training, given “Contracted Technical Support” or to be given the authority to take actions. Issues of discontent should therefore be explored further to determine their scope and possible impact. The CF’s Your Say Survey (14ck01-1, 14ck01-2, 14ck01-3, 14ck01-4, 14ck01-5, and 14ck01-7) and the CF Primary Reserve Continuous Attitude Survey (14ck03-3) are designed to measure the attitudes, circumstances and experiences of CF members on a semi-annual basis. The results are then used by senior leaders to evaluate existing and proposed policies, procedures and programs in the CF. The Navy could similarly use these results to explore some of the issues of discontent found in these analyses that are particular to the Navy.
- **The Health of Navy Personnel.** How healthy are naval personnel, in terms of physical and mental health, fitness, spiritual well-being, drug usage, etc.? There are currently numerous studies being conducted on CF personnel that could be of assistance in looking at issues in this domain. These include: Blind Drug Testing (14bj01-1), Pan CF Random Drug Testing (14bj01-2), Personality and Psychological Well-Being of New Recruits (14bj01-3), the Recruit Health Questionnaire (14bj01-4), the Health and Lifestyle Questionnaire (14bj01-5), Mental Health and Stigma in the CF (14bj01-6), Deployment Characteristics Related to Post-Deployment Mental Health Outcomes (14bj01-7), Psychological Well-Being in the CF (14bj01-8), Risk-Taking Propensity and Behaviour in CF Recruits and Implications for Their Military Careers (14bj01-9), Conceptual Model for Health and Fitness (14bj02-1), Participation in the CF Sports Program (14bj02-2), and Spiritual and Social Well-Being (14bj03-3).

In addition, is there an issue with burnout of personnel in the Navy? What impact do personnel management factors, such as evaluations, promotions and succession planning, and the requirements of service, such as long periods of deployment and life at sea, have on crew burnout and retention? There was recently a study conducted on burnout and compassion fatigue in support providers that may provide some



background information that would be useful in addressing these types of questions, especially given the humanitarian missions that the Navy has been involved in of late, such as the recent disaster relief provided to the victims of the Haiti earthquake (Coulthard, 2009).

- **Casualty Management for the Navy.** With increased optempo, it is important to carefully monitor issues related to casualty management. Whereas there is no specific Navy-focussed research currently being undertaken, there are four DRDC studies that could be informative: Care of the Ill and Injured Survey and Follow-on Research (14bk02-2), Injury Surveillance (14bk02-3), Care of Ill and Injured CF Personnel (14bk02-4), and Post Deployment Re-Integration (PDR) in Injured CF Personnel (14cb06-1).
- **Navy of the Future Quality of Life.** How do naval personnel see quality of life (QOL) in the future fleet? How important is it for personnel to have instant connectivity to networks of friends, homeport, etc.? Research on their social and physical work environment requirements should be undertaken. The work contained under Strategic Analyses of Naval HR Issues (14ar01-8), otherwise known as the Future Sailor Initiative, which is presently looking at the millennial generation, should provide some insight into this issue, as well as earlier studies that have been conducted under the auspices of the Director of Quality of Life (DQOL).

## 4.5 Compensation

Although compensation and benefits do not normally play a role in contributing to affective commitment, which is the emotional attachment to the values and goals of the Navy, they can have an adverse impact on a member's commitment when they are below expected standards. Research could be conducted to determine if current compensation and benefits packages are meeting naval personnel's expectations and identify what areas still need to be addressed. This would include studies, such as:

- **Analysis of Navy Compensation and Benefits.** Analysis of issues regarding compensation and benefits pertaining to the Navy would assist in the development and substantiation of new allowances or entitlements as outlined in the *CMS Strategic HR Campaign Plan* (DGMPR, 2009a). Lessons learned from a recent benchmark study on compensation and benefits in the Technical Cooperation Program (TTCP) militaries of Australia, Canada, New Zealand, the United Kingdom and the United States (US) may assist in this endeavour (Wang & Tanner, 2008), as well as ongoing DRDC research which includes: a strategic assessment of compensation and benefits (14bk05-1), an examination of the impact of compensation and benefits on recruiting and retention (14bk05-2), an evaluation of the CF Pension Program (14bk05-3), international benchmarking (14bk05-4), an evaluation of the CF Integrated Relocation Program (IRP) (14bk05-5), an examination of the adequacy of Private (PTE)/Lieutenant (LT) salaries in high cost of living areas (14bk05-6), and a study of the Long Term Impact of Imposed Restriction (IR) on CF Personnel and Their Families (14bk05-7).

- **Impact of Workforce Shortages.** It is anticipated that there could be intense competition in hiring replacement workers as the Baby Boomer generation retires from the workplace. This could likely impact the compensation and benefits offered by organizations, as they try to entice new employees with better packages. Presently there is little related DRDC research that would be of assistance in this endeavour, aside from an examination of the impact of compensation and benefits on recruiting and retention (14bk05-2), the HR External Environmental Scan (14ck03-1) and a forward-looking analysis of the implications of “neo-capital theories” on HR management in the CF (14ck03-5).

## 4.6 Families

It has been said in the Navy that “we recruit sailors, but we retain families” (Doran, 2003). Although there is currently no research specifically aimed at Navy families, DRDC does have an extensive research program addressing various issues related to military families: the CF Accommodation Study (14bk04-3); Economic Impact and Determinants of Military Life on Spousal Employment (14bk04-5); Childcare and Caregiver Study (14bk04-6); Collaboration with the US Deployment Health Research Center (14bk04-7); IR: The Impact on Families (14bk04-8); Spousal Quality of Life Survey (Second Administration) (14bk04-9); Well-Being of Reservist Families (14bk04-10); and Long Term Impact of IR on CF Personnel and Their Families (14bk05-7). These studies, if they do not have findings broken down by environment, could be replicated for the Navy.

## 4.7 Career Management

In many other business and government organizations, it is primarily the individual who initiates career mobility and generally has a veto power. However, the Navy, like most military forces, takes a far more proactive and controlling role in grooming potential candidates to meet operational, institutional and technical needs. Naval personnel are consulted about their preferences in terms of training, work and location, but their needs do not necessarily have the same priority as those of the organization. This situation, not surprisingly, can lead to frustration on the part of naval personnel and their families, which in turn may lead to retention issues. Whereas there is presently research being conducted on the CFPAS Replacement Project (14ap01-1) and the Promotion and Retention of Visible Minorities in the CF (14ap01-2), additional research could be conducted to study other critical issues related to naval career management:

- **Naval Career Management.** There has always been dissatisfaction associated with one being “career managed”. Research could clarify how sailors’ needs and preferences could be given more consideration in the career management process (vs. organizational needs). This would include a look at best practices in other militaries and private organizations. The Your Say Surveys (14ck01), previously discussed in Section 4.4, may also provide some insight into the dissatisfiers.
- **Naval Career Employment Paths.** One of the issues to be addressed in the *CMS Strategic HR Campaign Plan* (DGMPR, 2009a), is how to get sailors to sea more

effectively and efficiently. Best practices in other militaries could be examined to assist in this endeavour, as there is no related research presently being conducted by DRDC.

Although it is not identified in the *CMS Strategic HR Campaign Plan* (DGMPR, 2009a), there is also a need to better define and recognize a range of career employment paths, including CF headquarters “purple” positions, for various naval occupations. The focus has typically been on how to progress MARS officers as quickly and effectively as possible into command positions, but what other alternatives are there for MARS officers and other naval occupations? Not everyone is necessarily interested in command, and there are not enough command positions for those who are interested. A recent letter from CMS highlighted an “updated” career progression model for MARS officers as well as naval technical officers and naval logistics officers (DGNP, 2009). However, in looking at this “updated” model, little has actually changed, with the continued expectation that the Navy’s more senior leaders will only be selected from the sea-going command stream. This despite the fact that the letter states that “success is a function of much more than the historical benchmark of promotional advancement”. There is currently no research identified in the DRDC S&T Program that would provide assistance in such study, aside from one study that is evaluating the recently developed MAR ENG Military Employment Structure and Implementation Plan (14ar02-5).

- **Impact of New TOS.** The CF recently introduced new TOS. What is the impact of these new TOS on Navy recruitment and retention? Again the Your Say Surveys (14ck01) could be analyzed to see if they might provide some insight, otherwise a new study would be required.

## 4.8 Succession Planning

As outlined in the *Maritime Commander’s Strategic Intent for 2009 to 2012* (MARCOM, 2008a), “institutional renewal will require the Navy to formalize its succession planning system to both prepare the Navy’s future leaders for challenges at the national/strategic-level and position them to compete effectively for leadership appointments within the broader CF/DND.” Efforts are focused right now on outlining career paths for select individuals, but research could assist in broadening the scope of the work:

- **Succession Planning for Senior Naval Officers and NCMs.** This research would identify the key attributes desired for the Navy’s future leaders and would design appropriate selection and leader development systems, with a literature review of talent management issues also being conducted. One project is currently being conducted by DRDC, which is aiming to standardize succession planning initiatives across the three environments and the “purple” occupations, with the objective to better prepare future leaders for promotion to the higher ranks (Standardize Succession Planning Initiatives (14ap02-1)). This study should be imminently useful in looking at succession planning for the Navy.

## 4.9 Employment Management

To address some of the employment management issues identified in the *CMS Strategic HR Campaign Plan* (DGMPR, 2009a), such as manning priorities, optempo/perstempo, shipboard maintenance philosophies, etc., the following types of research studies could be of assistance in the effort to deal with the demands on naval personnel:

- **Optempo/Perstempo of Navy Personnel.** A study to examine optempo/perstempo factors pertaining specifically to Navy personnel could be conducted. Whereas there have been CF initiatives to examine this subject area, such as current studies on Deployment Policies and Practices Across TTCP Nations (14bk01-1), Attitudes Towards Length of Pre-Deployment Training and Length of Tour (14cj02-11), the Effect of Operations in Afghanistan on Career Intentions (14cj02-12) and Organizational Commitment (14cj02-13), research specifically focused on the Navy could be conducted.
- **Resiliency of Naval Personnel.** The resiliency of naval personnel, particularly during these times of increased optempo, should be examined. There are a number of studies currently being conducted by DRDC that would assist in such an effort, such as: Stress and Small Unit Operations (12qo), Circadian Entrainment to Counter Jet Lag and Shift Work (13pf), Resiliency After Capture (14cb02), PDR Adaptation (14cb04), Home Leave Travel Allowance (HLTA) Experiences (14cb05), PDR in Injured CF Personnel (14cb06), Adaptation in Augmentees (14cb07), Examination of Strain Across the Deployment Cycle (14cj02-14), Psycho-Physiological Readiness (14da), Operational Stress and Neuro-Cognitive Impairments (14db01), and Human Effectiveness in Sustained Operations and Adverse Environments (14dm). The Unit Morale Profile (UMP) also provides commanders with an objective “snapshot” of the state of morale in their units by measuring, and monitoring, indicators of psychological well-being of their members (14cj01-2). This was administered to HMCS TORONTO and HMCS PROTECTEUR in 2009 and will be administered to a number of naval units including the CF Naval Engineering School (CFNES) (14cj01-15), CMS Headquarters (14cj01-16), and the Acoustic Data Analysis Centre (Atlantic) (ADAC(A)) (14cj01-19).
- **Alternative Crewing Concepts.** Future fleet manning and alternative crewing options should also be explored in greater detail. With the expansion of roles for the Navy, particularly operations in the Arctic, the typical approach of one crew, one ship may not be an effective means to employ naval personnel. In addition, the transition period that the Navy is about to embark on means that there will be a reduction of platforms as old ships go into and come out of re-fit, which raises the question of what to do with the crews while the ships are in dry dock. Therefore, research should be conducted as to how alternative crewing concepts might incorporate rank requirements, occupational requirements, sea-shore ratios, regular/reserve mix, time away/respite period restrictions, nominal roll vs. actual numbers, collective and personal training, modularity or crew exchange (Blue-Gold crew) concepts, etc.? A Statement of Work for this research was drafted by the Directorate of Maritime Strategy (DMS, 2009a), but approval has yet to be granted. Related work on the

impact of automated damage control systems on crew optimization could be used in this study (11gc01), as well as lessons learned from ongoing research regarding teams could also be of assistance (Modelling of Team Performance (14de01), Military-Civilian Work Culture and Relations (14ck03-4), and Virtual Social Networking (14dl)).

## **4.10 Retention and Release**

### **4.10.1 Retention**

Premature attrition is costly - training related investments are not maximized and years of corporate knowledge are lost. For the Navy, it also means an irreversible reduction of potential candidates for future leadership and management positions. In recognition of these issues, the Navy has requested a new study to be conducted in 2010:

- **Retention of Navy Personnel (14aq01-6).** Key retention issues for naval personnel need to be identified. After all, it is one thing to make the Navy attractive from the outside, but it is another to keep people engaged once they are enrolled. Such a study will include an examination of the reasons why naval personnel are leaving at particular points in their career, but it will also entail looking at why people stay in the Navy. Related information could also be collected from the CF Retention Survey (14aq01-5, 14aq01-10, 14aq01-11) and the study on the Promotion and Retention of Visible Minorities (14ap01-2).

### **4.10.2 Transition and Release**

An inevitable part of the personnel management process involves the loss of personnel to retirement, to releases, and unfortunately to casualties. Research could be conducted to determine how to mitigate the impact for the Navy:

- **Attrition Monitoring.** It is critical that ongoing monitoring of attrition data be conducted so that increases in losses can be addressed expeditiously. DRDC has several studies that could be utilized for that purpose: the CF Exit Survey (14aq01-4), the ADM(HR-Civ) Exit Survey Pilot (14aq01-2), Attrition Reporting and Forecasting (14aq02-2), Impact of TFA on Attrition (14aq02-3), BMQ Attrition Analysis (14aq02-5), and Attrition in the Civilian Workforce (14aq02-6).
- **Departing with Dignity.** A literature review could also be conducted on issues related to transition and release from the Navy, with an examination of best practices and opportunities to perhaps better utilize those being released due to retirement or being ill/injured. One such study is currently being conducted by DRDC, which is the Veterans Affairs Canada (VAC)/DND Transition Study (14bk03-1). In addition, the Navy should try to ensure that when people leave, they at least do so on terms that will result in them being a friend of the Navy (vice an outspoken critic), as these people can be key assets in attraction and recruitment initiatives. Research on how to

ensure people leave on positive terms could assist in this effort, for example, Retention of Regular Force by Transfer to the Reserve Force (14aq01-1).

## 4.11 Honour and Recognition

Aside from the traditional forms of honouring and recognizing military personnel, such as medals and awards, alternatives could be examined. As compared to the private sector, there are fewer means to provide employees in the public sector with incentives, financial and otherwise, to deliver better than expected performance or additional time and effort. In the CF, promotion serves as the principal incentive to high performance as it offers additional pay, prestige, opportunities and responsibilities. However, it can also be a double-edged sword, as the benefits of promotion have to compete increasingly with the potential liabilities that are tied to the inherent requirement for mobility, most notably the potential loss of spousal employment (income and other benefits) and the potential negative aspects of having to physically relocate. There are also caps to the number of promotions that can be offered, which makes the use of promotion as a reward/incentive even harder. The following research could be conducted to examine this issue:

- **Honour and Recognition of Naval Personnel.** A literature review of effective means of recognizing personnel could be conducted, with a particular focus on alternative forms of recognition. DRDC recently conducted a benchmark study on honours and awards across TTCP nations (Tanner & Coulthard, 2008), which could provide a starting point for the study, and there is another study currently being conducted on what forms of recognition are important today (14bm02-01). Strategic Analyses of Naval HR Issues (14ar01-8) may also provide input with regards to what the Millennial Generation is looking for, with regards to honour and recognition.

## 4.12 Naval Reserves

The Future of the Naval Reserve Working Group (FNRWG) has recently been stood up to “examine the current employment model, conduct a mission analysis into what possible viable roles/missions could be assigned to the NAVRES, and consider the growing disenfranchisement of the Class A community and the ever increasing HR pressures on the NAVRES” (Jean, 2009). To support these initiatives, many of the research studies identified above may contain a NAVRES component, if sufficient data was collected. If there is insufficient data, separate studies for the NAVRES could be conducted that mirror the efforts for the Regular Force and help address the questions posed to the FNRWG.

## 4.13 Civilian Workforce

In order to fully integrate the civilian workforce employed with the Navy, a number of initiatives have been outlined in the *Maritime Commander's Intent for 2009 to 2012* (MARCOM, 2008a). To address some of the issues associated with these initiatives, research efforts could include the following:

- **Outreach to Targeted Youth and EE Groups.** In order to achieve workforce renewal objectives, such as meeting apprenticeship intake levels required to match projected attrition rates, research could be conducted on how to most effectively reach out to youth and EE groups.
- **Workforce Modeling.** Modeling and analysis could be conducted to ensure that the civilian workforce can achieve key effects, including the need to maintain the Navy's capacity to support fleet operations as well as to increase the capacity to renew infrastructure and develop the future maritime force.
- **Training.** Research could be conducted on alternative training methods to deliver job training requirements, individual learning plans for workforce renewal and succession planning, leadership and change management, and language training.

Information gleaned from current research activity within DRDC, such as: the Statistical Analysis of National Occupation Codes (14an01-2), Attracting the Best in S&T (14an01-5), Civilian Labour Market Research (14an01-6), Evaluation of the DND Mentoring Program (14ao04-1), ADM(HR-Civ) Exit Survey Pilot Study (14aq01-2), Attrition in the Civilian Workforce (14aq02-6), Civilian Workforce Modelling and Analysis (14ar02-3), EE Monitoring for ADM(HR-Civ) (14bl02-2), Civilian EE Employment Systems Review (14bl02-4), the Civilian Diversity Climate Survey (14bl02-5), the Public Service Employee Survey (PSES) (14ck01-11), and finally Military-Civilian Work Culture and Relations (14ck03-4), could assist in the efforts above, as would pertinent lessons learned from the research being conducted for the military workforce.

## 4.14 Strategic Planning

Much of the research discussed above is focused on helping to address the critical issues of today, with only a limited focus on the issues of tomorrow. To ensure a more balanced approach to the research program, a series of more strategic type analyses have been outlined under a new project, Strategic Analyses of Naval HR Issues (14ar01-8):

- **Future Sailor Initiative (used to be 11ia04).** The aim of this on-going research is to identify societal and demographic changes that will impact the Navy in terms of future personnel/workforce (DMS, 2009b). One paper has already been produced on Canadian demographic and Navy recruiting trends, which has shown that the Navy cannot afford to approach recruiting through a traditional lens, given the anticipated fierce competition for skilled workers and the shrinkage of the Navy's traditional recruit pool (Jesion & Dunn, 2007). Another paper is currently being written on generational differences and the implications of the millennial generation for the Navy, not only in terms of interest and propensity to join the Navy, but also in terms of training and education, employment and retention, leadership, etc. (DMS, 2009c).
- **Future Employment Concepts.** This study would examine what employment concepts will need to be considered for the future. What organizational changes will need to take place within the Navy? How might the Regular Force, Reserves, and civilian workforce be best integrated in the future? A current DRDC study, CF Force

and Occupational Structure Modelling Analysis (14ar02-2), may be able to assist in this effort.

- **Future Skills Sets.** Another study that could be conducted is an analysis of what future skill sets/abilities will be required by naval personnel, and do naval personnel currently have them? One might suspect that the historical recruit who has typically had less education may not meet the needs of the future Navy. So questions are raised – are better educated recruits required or is it sufficient to train and educate those that do come in the door? Will the future sailor need to be a “hybrid sailor” – one that has a mix of different skills and abilities which makes them cross-functional? What impact might all of this have on occupational structures? The job analysis currently being conducted for the Army of Tomorrow Project (14an02-4) might provide some useful insights.
- **Navy Culture Change.** Qualitative research could also be undertaken with new recruits, current serving members, senior leadership and recently retired members in relation to what they believe are cultural impediments in terms of transitioning to the future fleet. What are their views of the current Navy? What improvements do they believe are required? Are there any particular personnel concepts that they believe should be explored? What may be of interest during the course of this analysis are studies currently being conducted by DRDC, which are examining the Concept of Cultural Intelligence (14ca01-1), Warrior Culture and Soldier Identity (14ca01-4), Cultural Intelligence Development in CF Leaders (14ca02), the Army Culture Survey (14ca01-2), Interagency Trust (14ci), and the Army of Tomorrow Formation (Fmn) 2021 Functional Analysis (14cj03-1, 14cj03-3 and 14cj03-6).

## 4.15 Summary

Despite the amount of research already being conducted under the DRDC S&T Program, there is clearly much more that could be done to help address some of the critical personnel issues facing the fleet of today as well as the fleet of tomorrow. With limited time and resources, however, consideration has to be given to factors such as research prioritization, research coordination, and expansion of the research capacity, all of which will be discussed in the next chapter.



## 5. Discussion

---

Whereas there is no shortage of suggestions with regards to what research could be done pertaining to naval personnel issues, it is important to focus attention on what areas of research are critical and how targeted research could be delivered, given limited time and resources. The discussion below outlines a personnel research plan that could span the next five years, and highlights some key considerations regarding the conduct of such research.

### 5.1 Proposed Five-Year Research Plan

As discussed in Chapter 2, the Navy has several critical personnel issues that it needs to address so that it is ready for the fleet of tomorrow. The most critical of these is its recruiting challenges because little can be done unless there are actually people in the Navy, and many naval occupations are presently under-strength. The focus of the research related to attraction and recruitment thus far has been to examine why people join the Navy and what were their key influencers. And whereas that is important, there has yet to be any research to explore why people do not join the Navy, which would help the Navy tap into a far larger labour pool. Although it is not yet reflected in the PG 4 (Personnel) program, the Navy did request such an expansion of the current Navy Recruitment Study in the Fall of 2009 to include additional analyses to: 1) determine the factors that contribute to the low propensity to join the Navy; 2) examine “best practices” from other military and civilian organizations with regards to attraction and recruitment; and 3) develop strategies to broaden the applicant pool and increase the representativeness of particular groups (e.g. women, visible minorities, Aboriginals, Francophones) in the Navy in general and distressed occupations in particular. With the conduct of these studies, the Navy should have a better idea of the reasons why people do not want to join the Navy and how to overcome such obstacles. The first phase of this project, which examined the reasons why people have joined the Navy is due to be completed by the summer of 2010, so hopefully work can begin on the next phases before the end of the year.

The flip side to the recruiting challenge is retention. Once someone has joined the Navy, how does the Navy retain them in order to be able to use their skills and knowledge? DGMPPRA has just begun a study to better understand the factors related to the retention of naval personnel. Once this analysis is completed, anticipated to be the spring of 2011, the results should indicate areas for follow-on research. There may be one or more factors that significantly contribute to a person’s decision to either stay or leave the Navy, which will likely need to be explored more fully. For example, if the contributing issue were the length of time it takes to do training, a follow-on study could be to examine alternative methods of training delivery. Some of these types of studies are already contained within the PG 4 (Personnel) research program, so it may simply be a matter of leveraging other research. However, it is premature to speculate as to the findings of this study since it has only just begun.

While the Navy struggles with its recruiting and retention issues, it is also about to undergo a massive change as it transforms from the fleet of today to the fleet of tomorrow. There are enormous personnel implications related to this transition period, for how does the Navy continue to gainfully employ and develop its people when there will be fewer operational platforms while at the same time preparing its people for the new platforms. The HR modelling capability now contained in the Maritime Operational Research Team (MORT) has begun to look at this issue, with preliminary results recently passed to the sponsor (Bouayed & Ormrod, 2010). Work will continue over the coming months to broaden the model first to look at the entire Halifax-class fleet, and then to add in other types of platforms. The health of the naval occupations will also need to be closely monitored during this period, which could be assisted greatly by the adoption of DGMPRA's AMOR analysis capability. At the present time, the Navy relies on its occupational managers to monitor their occupations, however, DGMPRA's capability in this area could highlight potential issues more effectively and efficiently.

At the same time as the Navy deals with its most pressing personnel issues of today, sight cannot be lost on the personnel issues of tomorrow. A strategic HR analysis of the Navy's future leaders, the Millennial Generation, is presently underway and should be completed by the end of 2010. Once that study is completed, other strategic issues, such as alternative manning options with regards to how crews should be assigned to ships, future skill sets required for the fleet of tomorrow, future employment concepts, etc. could be examined (see Section 4.14). Studies such as these will help to insure that the Navy's management of its personnel keeps astride of its evolving fleet.

## **5.2 Research Considerations**

When considering the way ahead and with such an extensive list of on-going and potential research activities, consideration has to be given to a number of issues, including research prioritization, coordination, and capacity.

### **5.2.1 Research Prioritization**

With the number of studies discussed in the preceding chapters, prioritization is essential since there is currently only a limited personnel research capacity within the Navy. The most likely means to do this would be the establishment of a Maritime HR Research Committee, which would allow for a process by which all organizations within the naval community that have personnel research requirements could come together to discuss research priorities, and would ensure that the selected research activities support initiatives outlined in the *Maritime Commander's Intent* (MARCOM, 2008a), the *CMS Strategic HR Campaign Plan* (DGMPR, 2009a), and other strategic level documents. Key players could include, but not be limited to, representatives from D Mar Pers, DMTE and DMS, the S&T Director for PG 4 (Personnel), and possibly representatives from MARLANT and MARPAC. Other interested parties would include: the Command Personnel Selection Officer (PSO), the strategic HR analyst and HR modeler who are part of MORT, and representatives from other DRDC Centres, such as DGMPRA and DRDC Toronto. The Maritime HR Research Committee would review current

research being conducted, assess proposals for new research in terms of its relevance to MARCOM priorities, and approve a rolling five-year plan for naval personnel research activities. Not only would this improve communications between the Navy and the research community, but it would also help to improve communications within the Navy.

## **5.2.2 Research Coordination**

Naval personnel research, which is supported by DRDC, is currently being conducted in: 1) DMS, where strategic naval personnel research is being conducted by a defence scientist attached from MORT (14ar01-8); 2) MORT, where a HR modelling capability has recently been established (14ar01-7); 3) CMP, where researchers are working on the Navy Recruitment Study (14an03-3), the Post Great Lakes Deployment Study (14cn03-3), various selection studies pertaining to a number of naval occupations (14an02-1, 14an02-6, 14an02-8, 14an02-12 and 14an02-19), assorted UMP analyses for different units (14cj01-6, 14cj01-15, 14cj01-16, and 14cj01-19), and the Navy Retention Project (14aq01-6); and 4) DRDC Toronto and DRDC Atlantic, where human factor (HF) studies are being conducted (11af, 11ba, 11ca04, 11ci03, 11gc01, 11ge03, 11hg, 11hl, 11hm, 14dh07, 14dm, and 14dn). With research activities spread across so many agencies, it is easy for researchers and research coordinators to work in stove-pipes and not be aware of what others are working on, especially since projects related to naval personnel issues used to be spread across two different partner groups – PG 1 (Maritime) and PG 4 (Personnel). Add on top of this, the number of projects currently being undertaken by DRDC that are CF-centric but could have implications for naval personnel, and it becomes evident that effective and efficient communication of activities and results are critical so that research resources can be maximized. As a first step, the personnel research studies that used to reside under the PG 1 (Maritime) program, i.e. the Future Sailor Initiative, have been recently added to the PG 4 (Personnel) program for the coming fiscal year to increase visibility and build important links to other ongoing personnel research.

## **5.2.3 Research Capacity**

Given that there are only two analysts who are working directly for MARCOM on HR issues – one in DMS who is conducting the strategic naval personnel research and the other in MORT who is standing up the HR modelling capability – consideration should be given as to how the HR research capacity might be expanded. There are two PSOs in D Mar Pers, however, they are primarily focussed on staff officer functions and have little time for research. DRDC, i.e. DGMPRA, has additional resources that the Navy has been able to utilize for the limited number of studies that it has required thus far. However, if the research program expands substantially, as it has been proposed above, DRDC will be challenged to undertake all of the studies in a timely manner. So the question naturally arises as to how to expand the HR research capacity of the Navy. The answer comes in four parts.

#### **5.2.3.1 HR Modelling**

As has been mentioned earlier, an HR modelling capability has recently been established in MORT. As with any new capability, the question arises as to how best utilize it. Initially, the neophyte capability was used to begin analyzing the MARS officer production pipeline, but it has since been focused on addressing some of the critical manning issues associated with the Navy's transition from the fleet of today to the fleet of tomorrow, examining HCM scheduling issues. A scoping study needs to be conducted in the near future which would identify other potential areas where HR modelling could be used to provide recommendations for issues facing the Navy today and tomorrow. As well, connectivity to the R4 HR TDP (14a1) needs to be established. The aim of this project is "to build and demonstrate an integrated modeling and analysis software environment that provides the scientific and technological capability to simultaneously examine integrated aspects of Force Structure, Force Generation, and Force Employment", which would allow for "more comprehensive insights and alternatives to foster improved management of complex DND/CF personnel issues and their associated resources" (Isbrandt, 2009).

#### **5.2.3.2 Subsidized Post-Graduate Students**

The Navy could also better utilize its subsidized post-graduate students. Many begin their Masters or PhD studies with little or no input from their sponsors with regards to the type of projects that they should undertake while at university. A win-win situation could easily be established where students are provided with guidance on the type of issues they should be investigating and the organization gets academically supervised research done at no additional cost.

#### **5.2.3.3 Academia and Industry**

Although establishing relationships with academia and industry through contracts can be challenging from an administrative perspective, this avenue has to be explored to maximize the resources required to conduct personnel research for the Navy. If the DRDC S&T Program is used effectively, research proposals can be made to the various thrust coordinators within PG 4 (Personnel) who control funds for contracting, which means that the money does not necessarily have to come from MARCOM financial resources. Having a coherent research plan where the criticality of various research projects is apparent would assist in building the arguments necessary for accessing contracting opportunities from DRDC.

#### **5.2.3.4 International Collaboration**

Finally, opportunities for international collaboration should be explored. Under the purview of TTCP or NATO, there are research panels which are looking at critical issues facing each of the militaries involved. By collaborating, it is possible to expand each country's research capacity and to gain perspectives not readily apparent from within one's own military. A review of established panels needs to be conducted in the coming months, and opportunities

for collaboration need to be identified. For example, there is a significant amount of research being conducted at the US Navy Recruiting Command, the Navy Personnel Command, the Navy Personnel Research Studies and Technologies (NPRST) Center, and the Navy Manpower Analysis Center (NAVMAC), all co-located in Millington Tennessee, which could be explored further.

## **6. Conclusion**

---

### **6.1 Summary**

The research activities discussed above should assist the Navy in better understanding its critical personnel issues of today as well as preparing for the future. Given that the number of studies are clearly beyond the research capacity of the Navy, a multi-year plan will need to be developed with priorities assigned and opportunities identified that can be leveraged (in whole or part) by other CF initiatives, TTCP/NATO, industry, best practice organizations, and academia. This research plan should also be considered a “living” document as what may be the critical issues today may not be the critical issues of tomorrow. That being said, however, action needs to be taken to implement a coherent personnel research program for the Navy so that progress can begin.

### **6.2 Recommendations**

Recommendations are as follows:

- Establish a Maritime HR Research Committee which would review the projects outlined above, approve and prioritize selected studies, and then endorse a five-year rolling research plan.
- Build awareness and linkages amongst the various MARCOM/MARLANT/MARPAC units involved in naval personnel issues.
- Conduct a scoping study with regards to how best utilize the HR modelling capability recently established in MORT, and establish connections with the R4 HR TDP.
- Begin to build relationships with academia and industry so that the personnel research capacity in the Navy can be expanded.
- Conduct a scoping study to identify opportunities for international collaboration so that best practices and alternative perspectives can be easily collected from military allies, and explore the feasibility of travel to Millington Tennessee to visit the US Navy Recruiting Command, the Navy Personnel Command, NRPST, and NAVMAC.

## References

---

- Bouayed & Ormrod (2010), *Preliminary Analysis of Personnel Requirements for the HCM/FELEX Project Using the Managed Readiness Simulator*, 3553-1 (DRDC CORA), Department of National Defence, Canada.
- Coulthard (2009), *An Investigation into Burnout and Compassion Fatigue in Personnel Support Occupations*, DRDC CORA Technical Memorandum 2008-034, October 2008.
- DGMPR (2009a), *CMS Strategic Campaign Plan 2009-2013 (Version 8)*, Department of National Defence, Canada.
- DGMPR (2009b), *DGMPR Sitrep*, Email from Cmdre LM Hickey, 9 July 2009.
- DGMPPRA (2009), *Call for Personnel Research Requirements FY 10/11 (Annex B)*, 5000-1 (DGMPPRA), Department of National Defence, Canada.
- DGNP (2009), *Naval Officer Career Progression*, 3371-5075-1 (DGNP/RDIMS #182808), Department of National Defence, Canada.
- DGNP (2010), *Update on Navy Recruiting FY 09/10*, Email from Cmdre Hickey, 19 February 2010.
- DMS (2009a), *Canadian Navy Future Crewing Concepts Study*, Director General Maritime Force Development (DGMFD) Statement of Work, 29 January 2009.
- DMS (2009b), *The Future Sailor Initiative – Thoughts for the Future*, Briefing Note for DMS, 15 February 2009
- DMS (2009c), *The Future Sailor Initiative – Impact of the Millennials*, Briefing Note for DGMFD, 15 May 2009.
- Doran (2003), Presentation to the 5<sup>th</sup> Annual National Military Children Education Coalition Conference by Admiral Walter Doran, Commander of the US Pacific Fleet, 31 July 2003, <http://www.militarychild.org/files/pdfs/7-31-03.pdf>, accessed 15 March 2010.
- DRDC (2006), *Defence S&T Strategy – Science and Technology for a Secure Canada*, Department of National Defence, Canada.
- DRDC (2008), *DRDC Annual Report (2007-2008) - Shaping Defence and Security Capabilities Through Science and Technology*, Department of National Defence, Canada.
- Dunn (2008), *Navy Human Resource Research Considerations*, 3553-1 (MORT), Department of National Defence, Canada.
- Isbrandt (2009), *Right Person, Right Qualification, Right Place, Right Time (R4) Human Resource (HR) Technology Demonstration*, Presentation to the Senior Review Board, 28 April 2009.
- Jean (2009), *FNRWG*, Email from Capt (N) RH Jean, Deputy Commander of the Naval Reserve, 26 February 2009.
- Jesion & Dunn (2007), *Demographics and the Canadian Navy*, DRDC CORA Technical Memorandum 2007-01, January 2007.

MARCOM (2007), *MARCOM Strategic Assessment 2008*, 3371-1948-1 (MS COS / RDIMS 127610), Department of National Defence, Canada.

MARCOM (2008a), *Maritime Commanders Intent for 2009 to 2012*, 3371-1948-1 (DMSC / RDIMS 136353), Department of National Defence, Canada.

MARCOM (2008b), *MARCOM Strategic Assessment 2009*, 3371-1948-1 (DGMSM / RDIMS 161788), Department of National Defence, Canada.

MARCOM (2010), *MARCOM Strategic Assessment – 2010 Amendment*, 3371-1948-1 (DGMSM/RDIMS 198322), Department of National Defence, Canada.

Tanner & Coulthard (2008), *Military Honours and Awards: A Preliminary Exploration of Recognition in TTCP Countries*, DRDC CORA Technical Memorandum 2008-15, June 2008.

Wang & Tanner (2008), *Military Compensation and Benefits – A Preliminary Exploration of Policies in TTCP Countries*, DRDC CORA Technical Memorandum 2008-28, October 2008.

Wikipedia (Human Factors), [http://en.wikipedia.org/wiki/Human\\_factors](http://en.wikipedia.org/wiki/Human_factors), Accessed 19 August 2009.

Wikipedia (Human Resources), [http://en.wikipedia.org/wiki/Human\\_resources](http://en.wikipedia.org/wiki/Human_resources), Accessed 19 August 2009.

Wikipedia (Social Sciences), [http://en.wikipedia.org/wiki/Social\\_science](http://en.wikipedia.org/wiki/Social_science), Accessed 19 August 2009.



## Annex A – CMS Strategic Campaign Plan Activities

The following table provides further details about the CMS Strategic HR Campaign Plan, outlining its various activities, with their respective status as of 17 November 2009 and their Office of Primary Interest (OPI). Objectives are listed for those activities that have such information documented; not all activities, however, have been fully documented with objectives.

**Table A1: Details on the CMS Strategic HR Campaign Plan**

<b>A. Recruiting</b>			
<b>Activity</b>	<b>Status</b>	<b>OPI</b>	<b>Objective</b>
A.1 Define concept of naval recruiting Ops between DMTE and Formation Outreach Coordinators	Commenced	DMTE	<ul style="list-style-type: none"> <li>- To broaden attraction efforts (geographically, demographically).</li> <li>- To recruit with better effect, meaning greater efficiency (cost vs result).</li> <li>- To increase intake (improve attraction methods).</li> <li>- To reduce attrition (selectivity in target audience).</li> <li>- To produce an endorsed and approved Concept of Operations for naval recruiting.</li> </ul>
A.2 Provide SOPs, guidance and provision of accounts for AIM (Attractions Information Management System)	Completed	DMTE	- To have all organizations involved with Navy recruiting and attraction use AIMS to plan and coordinate their activities.
A.3 Target attraction activities on economically depressed communities	Ongoing	DMTE	To conduct naval attraction activities in geographic areas where people are more likely to be interested in employment in the CF, due to limited options for employment in those communities.
A.4 Use joint teams (Res, Reg, Civ) to visit schools and job fairs	Ongoing	MARLANT / MARPAC	<ul style="list-style-type: none"> <li>- To identify and gather information concerning all job fairs in the AOR.</li> <li>- To assess each for the value of participation.</li> <li>- To participate, as appropriate, possibly cooperatively in combined teams, with Reserve, Regular Force and civilian attraction information.</li> </ul>
A.5 Establish Navy Tech Recruiting Teams	Commenced	DMTE	
A.6 Expand on Navy NCM SEP college visits	Ongoing	DMTE	- To plan and implement expanded national level Navy visits to the NCM SEP accredited colleges for the purpose of promoting the Navy's partnership and enrolment programs to their faculty and students.
A7. Fix recruiting bonus issue (process, amount, education)	Completed	DMTE	
A8. Establish Formation recruiting cells	Completed	MARLANT	

**Table A1: Details on the CMS Strategic HR Campaign Plan (cont.)**

A9. Conduct Navy Tech Recruiting Team visits to NRDs	Ongoing	DMTE	- To familiarize NRD personnel with current recruiting, career and training opportunities, once the Navy Tech Recruiting Teams are established.
A10. Investigate greater use of "home towners" for attraction	Commenced	DMTE	- To investigate the development of a "home-towners" program to send Navy personnel to their home towns for the purpose of promoting the Navy.
A11. NAVRES support to CFRC processing	Completed	NAVRES	- To improve the efficiency of naval file processing at CFRCs.
A12. Increase use of NAVRES to support Navy recruiting	Ongoing	NAVRES	- To positively impact/improve support to recruiting to enable NRDs and their personnel to be full partners in attraction and recruiting for both the NAVRES and the Navy in their local communities and surrounding regions.
A13. Incentivize "every sailor as a recruiter"	Commenced	DMTE	- To investigate an incentive program to reward Navy personnel who assist with the recruitment of civilians into naval occupations.
A14. Investigate potential Navy CO-OP programs	Ongoing	DMTE	- To investigate potential Navy CO-OP programs and implement such programs where it is deemed they would be effective in improving the recruiting efforts in a region.
A15. Investigate increase to enrolment allowances	Not yet started	D Mar Pers	
A16. Amend recruiting policy to nationally advertise the NCM SEP program	Completed	DMTE	
A17. Establish Navy Operations Recruiting Teams	Commenced	DMTE / D Mar Pers	
A18. Investigate Job Experience Co-OP Programs	Commenced	MARLANT	
<b>B. Individual Training &amp; Education</b>			
<b>Activity</b>	<b>Status</b>	<b>OPI</b>	<b>Objective</b>
B1. Provide update on HCM FELEX training requirements	Ongoing	DMTE	- To successfully integrate HCM FELEX training requirements, which include trainers and simulators, trainer and simulator modifications, initial cadre training, conversion training and steady-state training, into the NTS.
B2. Address coastal training imbalance (time away from home )	Commenced	DMTE	- To conduct individual (occupation), professional development (PD) and collective training (CT), including refresher training, in the geographical location of the trainee's home-port division. - To formulate a plan that reduces or eliminates the imbalance in coastal training capabilities that results in reducing sailors' time away from home due to training requirements. Despite a roughly 60/40 split in naval personnel between the east and west coast, training capabilities are heavily skewed towards the east coast.

**Table A1: Details on the CMS Strategic HR Campaign Plan (cont.)**

B3. Develop accreditation equivalents	Commenced	DMTE / D Mar Pers	- To evaluate all navy IT&E and related work experience to determine full or partial civilian accreditation through a CDA-led initiative. It should be noted that Navy IT&E will continue to be designed and developed to meet the needs of job specifications (ie operational requirements) and not with the aim of meeting the accreditation requirements of civilian training and educational institutions.
B4. Reduce PD requirements impacting personal time	Commenced	DMTE	- To insure that distributed learning (DL) modules be considered no differently than residential modules, in that these modules are considered part of the training day and not to be completed on the students' own time.
<b>C. Operations/Refresher Training</b>			
<b>Activity</b>	<b>Status</b>	<b>OPI</b>	<b>Objective</b>
C1. Review refresher training requirements	Commenced	MARPAC (FEWG)	- To review CFCD 102(D), CFCD 129 and the Sea Training Guide to determine if savings in personnel or resources can be achieved by extending, reducing or eliminating certain objectives. - recommendation has been made to remove this item from the HR Campaign Plan (17 Nov 09)
<b>D. Occupational Management</b>			
<b>Activity</b>	<b>Status</b>	<b>OPI</b>	<b>Objective</b>
D1. Review QSPs occupation structure	Ongoing	DMTE	- To conduct QSPWBs in response to job-based specifications (JBS)/Qualification Requirements Assessment Boards and annual verification schedule. - To re-align training in accordance with the new JBS structure, update training in accordance with changing job requirements, review academic requirements and placement, re-design training delivery to incorporate e-learning and consider modularization to minimize training time away from operational units.
D2. Provide project manning update (HCM, JSS, AOPS)	Commenced	D Mar Pers	- To clearly understand the incremental personnel implications associated with the HCM/FELEX, JSS and AOPS projects as well as the commensurate impacts on occupation progression.
D5. Create a Future Requirements Cell	Completed	D Mar Pers	- To establish a future requirements cell that will look to future personnel needs and develop plans to address navy requirements.
D6. Conduct unit level/occupation establishment reviews	Commenced	D Mar Pers	- To establish a clear understanding of the naval establishment and to align the same to naval needs both today and into the future.

**Table A1: Details on the CMS Strategic HR Campaign Plan (cont.)**

D7. Resolve SAC way ahead	Completed	DMTE / D Mar Pers	
<b>E. Morale and Welfare</b>			
<b>Activity</b>	<b>Status</b>	<b>OPI</b>	<b>Objective</b>
E2. Establish consistent deployment reintegration processes	Completed	D Mar Pers	- To ensure that all naval personnel are subjected to a complete reintegration process upon return from international deployment.
<b>F. Compensation</b>			
<b>Activity</b>	<b>Status</b>	<b>OPI</b>	<b>Objective</b>
F1. Create a capability allowance (Subs, Cert 3s, NETs)	Not started	D Mar Pers	- To create capability allowances. The Navy needs the flexibility to target tradesmen in red occupations as the supply and demand ebbs and flows. Retention bonuses are a stopgap measure that will allow us to mitigate the looking implications of FRP as the "experiential gap" works its way through the system.
F2. Resolve current outstanding compensation items	Commenced	D Mar Pers	- To resolve all current outstanding compensation issues by spring 2009, including resolution of SUBSPA designated position grievances, payment of SDA in conjunction with HA, SUBCA, PIDA and changes to specialist pay incentive methodology, and pay review of NAVCOMM and NET/NWT.
F3. Improve leave entitlement flexibility	Completed	D Mar Pers	- To contribute to the review of leave policies and entitlements through the JSRAT and DPPD planned review. Two specific action items include the reduction in the number of years of service required to earn six weeks of annual leave and the increase in the unit commanding officer's ability to recognize the contributions made by deserving personnel.
F4. Create a TOS renewal bonus	Not started	D Mar Pers	- To create a TOS renewal bonus, as persons who currently choose to retire at TOS gates can receive a very attractive lump sum payment along with their retirement benefits, and yet those that choose to stay receive no immediate benefits.
<b>G. Families</b>			
<b>Activity</b>	<b>Status</b>	<b>OPI</b>	<b>Objective</b>
G1. Investigate ways to mitigate disruption of spousal earnings	Commenced	D Mar Pers	- To develop appropriate CF Family Employment policy and programs.
G2. Increase support to MFRC programs	Commenced	D Mar Pers	

**Table A1: Details on the CMS Strategic HR Campaign Plan (cont.)**

<b>H. Career Management</b>			
<b>Activity</b>	<b>Status</b>	<b>OPI</b>	<b>Objective</b>
H1. Modify TOS sequencing	Completed	D Mar Pers	- To introduce more flexible TOS that will encourage personnel to accept new TOS without needless penalties.
H2. Increase CFTPO flexibility (for deployed ships)	Completed	D Mar Pers	
H3. Get sailors to sea earlier	Completed	DMTE / D Mar Pers	- To meet operational requirements and motivating/retaining silors by designing and developing training to meet Job Based Specifications in the most effective and efficient manner within the shortest timeframe.
<b>J. Succession Planning</b>			
<b>Activity</b>	<b>Status</b>	<b>OPI</b>	<b>Objective</b>
J1. Introduce succession planning cell	Completed	D Mar Pers	
<b>K. Employment Management</b>			
<b>Activity</b>	<b>Status</b>	<b>OPI</b>	<b>Objective</b>
K1. Suppress OKSKEDs appetites	Commenced	MARLANT / MARPAAC	- To ensure Pers Tempo and personnel availability is factored into the planning of future Formation and Fleet operations. - To limit the scheduling, for a certain number per year per ship of naval outreach/attraction Day Sails to times that are convenient to the specific ship based on their primary employment/task.
K2. Re-introduce Reduced Duty Watch	Completed	MARPAAC	- To identify the numbers of personnel and make up of a harbour duty watch that would still meet acceptable risk management levels.
K3. Rationalize WOD/FP	Completed	MARPAAC	- To rationalize numbers and make-up of CPF WOD to be able to respond to FP requirements in all FP states.
K4. Standardization of personnel data collection (volatility)	Commenced	MARLANT / MARPAAC / NAVRES	- To have a common pan-Navy IT system, with which to view from a common HR interface system, CF wide/common databases, conveniently and easily at unit or HQ levels, personnel readiness, volatility of AP on personnel amongst ships or from ashore to ships. - To have a system that will facilitate training management, both IT and Refresher training.

**Table A1: Details on the CMS Strategic HR Campaign Plan (cont.)**

K5. Review CMS manning priorities (incl Force Protection)	Commenced	D Mar Pers / NAVRES	
K6. Elaborate an interim policy for Formation Guard forces	Completed	D Mar Pers	
K7. Reduce MCDVs Ops/Pers Tempo	Commenced	MARLANT / MARPAAC	- To reduce the MCDV's optempo to a sustainable level.
K8. Standing up Coastal incremental tasking/Pers Tempo management cells	Completed	MARLANT / MARPAAC	- To achieve personnel management structure in MARPAAC which mimics that of MARLANT. - To create a centrally located staff, augmented by MOSID advisors or senior NCM trackers, for the critical trades.
K9. Prioritize incremental tasking (internal and external)	Completed	D Mar Pers	- To introduce a priority system to address the increasing numbers of incremental taskings and the continuing limited numbers of personnel available to meet these additional requirements.
K10. Review Shipboard Maint Philosophy	Commenced	DGMEPM / D Mar Pers	
K11. Final disposition Formation Guard Force	Completed	D Mar Pers	
<b>M. Retention</b>			
<b>Activity</b>	<b>Status</b>	<b>OPI</b>	<b>Objective</b>
M1. Create retention management cells (Nav RAT)	Ongoing	D Mar Pers / NAVRES	
M2. Introduce mandatory COs interview prior to release (Div Book)	Ongoing	MCCPO / D Mar Pers	
M3. Released members contact with local NRDs (and vice versa)	Commenced	NAVRES	- To develop an Attraction and Communication strategy that will enable qualified releasing or released CF personnel to continue serving in the Navy.
M4. Geographical stability	Not started	D Mar Pers	
M5. Retention/Attraction of retired members/officers	Ongoing	D Mar Pers	
M6. MARS Officer promotion requirements	Completed	D Mar Pers	

**Table A1: Details on the CMS Strategic HR Campaign Plan (cont.)**

<b>N. Recognition</b>			
<b>Activity</b>	<b>Status</b>	<b>OPI</b>	<b>Objective</b>
N2. Improve Navy awards and recognition program	Commenced	MARLANT / MARPAC / NAVRES	
<b>P. Communications</b>			
<b>Activity</b>	<b>Status</b>	<b>OPI</b>	<b>Objective</b>
P1. Improve internal communications	Commenced	D Mar Pers	
<b>Q. Naval Reserves</b>			
<b>Activity</b>	<b>Status</b>	<b>OPI</b>	<b>Objective</b>
Q1. Re-confirm strategic role of Naval Reserves	Commenced	NAVRES / DMS	- To re-confirm the strategic role of the Naval Reserve to ensure that the Naval Reserve remains operationally relevant and focussed on meeting the needs of the Navy.
Q2. Update of Class C MCDVs	Commenced	D Mar Pers	- To increase the Reserve full-time establishment of the KINGSTON class vessels to 31 in order to allow a one in three watch rotation.
Q3. Harmonization of HR policies (Reg/Res)	Commenced	D Mar Pers	- To first reduce, and then eliminate, orders, regulations and instructions which perpetuate different HR policies for Reserves. - To promulgate Total Force Policy in single order documents.
Q4. Reserve force backfill policy	Completed	D Mar Pers	- To streamline the Reserve backfill of Regular Force positions and promulgate a Class C backfill policy for the KINGSTON class that does not adversely affect incumbents on Temporary medical categories under six months.
Q5. Part time/full time employment framework	Commenced	NAVRES / D Mar Pers	- To replace the current three classes of Reserve Service with a full-time /part time employment framework. - To provide more equitable compensation and benefits for Reservists employed full-time.
Q6. Delink benefits from Reserve classes of service	Commenced	D Mar Pers	- To provide a single level of health and dental care irrespective of class of service as well as access to PSP services.





## Annex B – DRDC Personnel Research Directly Related to the Navy

---

The following table provides further details about research being conducted by DRDC specifically for the Navy which involve personnel type issues, be they human resource management or human factors type issues (see Table 1 in the main body of the paper). This synopsis is based on a review of the Collaborative Planning and Management Environment (CPME) done in February 2010. The project number follows the convention of the first digit referring to its business line, the second digit referring to its partner group, the third digit referring to its thrust, the fourth digit referring to the project, and the fifth digit, if there is one, referring to the work breakdown element. End dates are provided to give the reader an idea of how long the project is expected to take to completion; and the project manager and DRDC delivery centre are provided in case the reader wants to contact them for further details.

**Table B1: Details on DRDC Research Directly Related to Naval Personnel**

Thrust 11a - Above Water Warfare				
Project #	Title	Status / End Date	Project Mgr / Delivery Centre	Objective
11af -	Joint Fire Support TDP	Active (31 Mar 11)	G. Prudat (Valcartier)	To develop the specifications required that will allow a spotter (land, sea, or air based) to designate a target for engagement by the most appropriate weapon system available within the joint force. To this end, a process will be designed that will allow the investigation and testing (gap analysis) of sensors, targeting (ID), decision aids/tools, procedural processes, command and control, <b>allocation of personnel</b> , desired weapons effects and BDA in order to optimize the fire support solution in a joint as well as a multi-national coalition environment.

**Table B1: Details on DRDC Research Directly Related to Naval Personnel Issues (cont.)**

<b>Thrust 11b - Maritime Command and Control</b>				
<b>Project #</b>	<b>Title</b>	<b>Status / End Date</b>	<b>Project Mgr / Delivery Centre</b>	<b>Objective</b>
11ba -	VICTORIA Class Submarine (VCS) C3 Human System Integration (HSI) Optimization	Active (31 Mar 12)	B. Chalmers (Atlantic)	To design an improved and evolved VCS control room and C3 systems. Using constructive and human-in-the-loop experimentation in a virtual platform, the objective is to develop C3 <b><i>HSI concepts</i></b> , matched to the VCS CONOPS, and to provide the Canadian navy with validated future alternatives for evolving the C3 capability of the VCS.
<b>Thrust 11c - Underwater Warfare</b>				
<b>Project #</b>	<b>Title</b>	<b>Status / End Date</b>	<b>Project Mgr / Delivery Centre</b>	<b>Objective</b>
11ca -	Enabling CF Multi-static Sonar	Active (31 Mar 12)	J. Theriault (Atlantic)	To develop integrated multistatic sonar ASW technologies for warships, submarines and maritime air assets. The focus will be on CONOPS, new sources and semi-intelligent sensors, and <b><i>operator workload reduction (11ca04)</i></b> .
11ci -	Underwater Intervention in SW/VSW Ops	Active (31 Mar 12)	E. King (Atlantic, Toronto)	To improve the capability to undertake MCM, combat diving and SOF operations in SW/VSW, including the <b><i>human machine interface (11ci03)</i></b> .
<b>Thrust 11g - Naval Platform Technology</b>				
<b>Project #</b>	<b>Title</b>	<b>Status / End Date</b>	<b>Project Mgr / Delivery Centre</b>	<b>Objective</b>
11gc -	Direct Client Support - CSC Naval Platform	Active (31 Mar 12)	M. Tunncliffe (Atlantic, Toronto)	To deliver timely advice to the Destroyer Replacement Project team on Naval Platform issues on an as-tasked basis, including <b><i>a survey of crew optimization strategies and the development of a simulation model that can be used to measure the effectiveness of proposed crewing levels for damage control (11gc01)</i></b> .

**Table B1: Details on DRDC Research Directly Related to Naval Personnel Issues (cont.)**

11ge -	Simulation of Naval Platform Systems	Active (31 Mar 12)	K. McTaggart (Atlantic)	To develop validated simulations that can be customized and adapted in a timely manner (e.g. within 6 months) to DND requirements in support of acquisition, maintenance, operational planning and training, including <b>a simulation of human dynamics during deck operations (11ge03)</b> .
<b>Thrust 11h - Maritime Domain Awareness</b>				
<b>Project #</b>	<b>Title</b>	<b>Status / End Date</b>	<b>Project Mgr / Delivery Centre</b>	<b>Objective</b>
11hg -	Collaborative Knowledge Exploitation for Maritime Domain Awareness	Active (31 Mar 13)	J. Roy (Valcartier, Ottawa, Atlantic)	To explore and develop an integrated collaborative knowledge exploitation technology framework <b>to allow operators</b> to quickly find, access, create, organize, share, use and reuse relevant knowledge for maritime awareness in ops centres of the JTFA/JTFP and CANCOM Headquarters.
11hl -	Technologies for Trusted Maritime Situational Awareness	Active (31 Mar 12)	A. Isenor (Atlantic, Ottawa)	To enhance the ability of the CF to share complex operational information and data in a secure, reliable and efficient way to build trusted Maritime Situational Awareness <b>among teams of decision makers</b> .
11hm -	Maritime Domain Analysis Through Collaboration and Interactive Visualization	Active (31 Mar 14)	V. Lavigne (Valcartier, Atlantic)	To help improve maritime situational awareness and <b>increase effective teamwork</b> through the use of visual and interactive interfaces that support maritime domain analysis with an emphasis on collaboration.
<b>Thrust 14a - Plan, Recruit, Train, Educate and Career Manage</b>				
<b>Project #</b>	<b>Title</b>	<b>Status / End Date</b>	<b>Project Mgr / Delivery Centre</b>	<b>Objective</b>
<b>14an – Attraction, Selection and Recruiting</b>				
<b>14an02 – Selection Tests and Standards</b>				
14an02-1	CF Selection Standards	Active (31 Mar 10)	LCol D. O'Keefe (DGMPPRA)	To identify the core competencies required for successful performance in CF occupations/roles and recommend selection standards for MOCs, including <b>Clearance Diver</b> and <b>MARS Officer</b> .

**Table B1: Details on DRDC Research Directly Related to Naval Personnel Issues (cont.)**

14an02-6	Submariner Selection	Active (31 Mar 10)	Maj. M Girard (DGMPPRA)	Based on a literature review, to recommend assessment techniques & selection system for Submariner employment.
14an02-8	Evaluation of the LOGISTICS Departmental Coord in HMCS Ships	Active (31 Mar 10)	Maj C. Suurd (DGMPPRA)	To conduct a job analysis to determine critical attributes.
14an02-12	NOAB Evaluation and Validation	Active (31 Aug 10)	Maj C. Suurd (DGMPPRA)	To review the NOAB and conduct validation studies.
14an02-19	MOST Analysis and Validation	Active (31 Aug 10)	Maj C. Suurd (DGMPPRA)	To conduct validation of the MOST.
14an03 - Recruitment				
14an03-3	Navy Recruitment Project	Active (30 Jun 10)	L. Williams (DGMPPRA)	To assess factors of relevance to Navy in attraction and recruitment of personnel using both existing data sources and focus groups.
14aq – Retention and Release				
14aq01 – Retention				
14aq01-6	Navy Retention Project	New (31 Mar 11)	N. Holden (DGMPPRA)	To better understand the factors related to the retention of naval personnel.
14ar - Human Resource Planning				
14ar01 – Strategic Level				
14ar01-7	Transition to the Future Fleet	New (31 Mar 12)	G. Christopher (DGMPPRA)	To enable the navy to analyze key personnel issues associated with the transition from the fleet of today to the fleet of tomorrow.
14ar01-8	Strategic Analyses of Naval HR Issues (used to be contained under 11ia04)	New (1 Jun 12)	L. Tanner (CORA)	To examine critical strategic issues related to naval personnel, including the Future Sailor.
14ar02 – Occupational Level				
14ar02-5	MAR ENG MES IP	New (1 Jun 10)	G. Christopher (DGMPPRA)	To have DGMPPRA model the MAR ENG occupation in order to validate the revised occupational and job based structure in support of the occupational study currently in progress within DPGR, which will lead to a Military Employment Structure and Implementation Plan.
14ar05 – Database Support				
14ar05-2	Ad Hoc Workforce Modelling and Statistical Analysis	Active (31 Mar 12)	G. Christopher (DGMPPRA)	To provide Workforce Modelling and Statistical Analysis on an ad-hoc basis, including studies on <b><i>Female Naval Officer Trends</i></b> and <b><i>Navy Training Requirements</i></b> .

**Table B1: Details on DRDC Research Directly Related to Naval Personnel Issues (cont.)**

<b>Thrust 14c - Individual, Operational and Organizational Effectiveness</b>				
<b>Project #</b>	<b>Title</b>	<b>Status / End Date</b>	<b>Project Mgr / Delivery Centre</b>	<b>Objective</b>
<b>14cj - Operational Effectiveness</b>				
<b>14cj01 – Human Dimension Assessment In Garrison</b>				
14cj01-6	Navy UMP Strategic Analyses	New (31 Mar 14)	Cdr S. McMillan (DGMPRA)	To enable senior navy leadership to better understand the issues impacting the readiness and effectiveness of naval personnel.
14cj01-15	Unit Morale Profile (CFNES)	New (TBD)	Capt D. Kilby (DGMPRA)	To use the UMP to measure the human dimensions of unit operational effectiveness, by providing an objective “snapshot” of the state of morale in the unit, measuring and monitoring indicators of the psychological well-being of the members.
14cj01-16	Unit Morale Profile (CMSHQ)	New (30 Apr 10)	Capt D. Kilby (DGMPRA)	To use the UMP to measure the human dimensions of unit operational effectiveness, by providing an objective “snapshot” of the state of morale in the unit, measuring and monitoring indicators of the psychological well-being of the members.
14cj01-19	Unit Morale Profile (ADAC(A))	New (31 Dec 10)	Capt D. Kilby (DGMPRA)	To use the UMP to measure the human dimensions of unit operational effectiveness, by providing an objective “snapshot” of the state of morale in the unit, measuring and monitoring indicators of the psychological well-being of the members.
<b>14cn - Geographic Information System Capability</b>				
<b>14cn03 – Methodology Development</b>				
14cn03-4	Post Great Lakes Deployment Report	Active (31 Dec 13)	F. Moffatt (DGMPRA)	To provide a socio-demographic profile based on GIS analysis of visitors to the ship during its Great Lakes deployment.

**Table B1: Details on DRDC Research Directly Related to Naval Personnel Issues (cont.)**

<b>Thrust 14d - Human Integration</b>				
<b>Project #</b>	<b>Title</b>	<b>Status / End Date</b>	<b>Project Mgr / Delivery Centre</b>	<b>Objective</b>
14dc -	Environmental Health Mitigations (Monitoring of Water Contamination for Diving – 14dc01)	Active (31 Mar 11)	S. Stergiopoulos (Toronto)	To adapt DRDC's dispersive ultrasound technology to prove rapid assessment of water contamination and suggest appropriate protection for diving operations.
14dh -	Support to Operations – Human Integration (Dry Suit Replacement Trial – 14dh07)	Active (31 Mar 10)	(Toronto)	

## Annex C – Other DRDC Personnel Research That Could Have Implications for the Navy

---

The following table provides further details about personnel research being conducted by DRDC for other clients that could have implications for the Navy, based on a review of CPME done in February 2010 (see Table 2 in the main body of the paper). The project number follows the convention of the first digit referring to its business line, the second digit referring to its partner group, the third digit referring to its thrust, the fourth digit referring to the project, and the fifth digit, if there is one, referring to the work breakdown element. End dates are provided to give the reader an idea of how long the project is expected to take to completion, and the project manager and DRDC delivery centre are provided in case the reader wants to contact them for further details.

**Table C1: Details on Other DRDC Personnel Research That Could Have Implications for the Navy**

<b>Thrust 10a - Strategic &amp; Future Environment</b>				
<b>Project #</b>	<b>Title</b>	<b>Status / End Date</b>	<b>Project Mgr / Delivery Centre</b>	<b>Objective</b>
<b>10af – Interacting Organizations</b>				
10af04	Psycho-Social Factors SAS Panel	Active (31 Mar 11)	P. Chouinard (CORA)	
10af07	TIF Modelling Meta-Organization Collaboration and Decision-Making	Active (31 Mar 11)	P. Chouinard (CORA)	Activities include examinations of: 1) Collaboration and Coordination, 2) Multi-Level/Agency Decision Making, 3) Multi-Agency Modelling, 4) InVivo Decision Making Simulation, 5) Geo-Spatial Cognitive Factors, 6) Social Factors of Professionalism, and 7) Institutional Analysis
<b>Thrust 10b - Operations Analysis and Integrated Solutions</b>				
<b>Project #</b>	<b>Title</b>	<b>Status / End Date</b>	<b>Project Mgr / Delivery Centre</b>	<b>Objective</b>
<b>10bi – International Logistics Readiness and Mobility</b>				
10bi02	Redeployment Planning and Simulation Model	Active (31 Mar 11)	P. Moorhead (CORA)	To develop a decision support tool for planning JTF Afghanistan redeployment and movement options.

**Table C1: Details on Other DRDC Personnel Research That Could Have Implications for the Navy (cont.)**

10bi03	HR Operational Sustainment Model	Active (31 Mar 11)	P. Moorhead (CORA)	To develop a toolset that allows for the management of CF support personnel to ensure that adequate numbers are available, trained and positioned to deploy, sustain and redeploy in support of the defence tasks delineated in CFDS.
<b>Thrust 12o - Land Command</b>				
<b>Project #</b>	<b>Title</b>	<b>Status / End Date</b>	<b>Project Mgr / Delivery Centre</b>	<b>Objective</b>
12og -	JIMP Essentials in the Public Domain: Implications for Training and Education for the Tactical Commander	Active (31 Mar 12)	A. Febbraro (Toronto)	To conceptually clarify the "public" aspects of the JIMP capability and how it may be optimally achieved, focusing on the development of knowledge, education and training for the tactical commander; and to identify individual differences / aptitudes that enable a person to work effectively and succeed in a JIMP environment, with implications for training, selection and teamwork.
<b>Thrust 12q - Land Act</b>				
<b>Project #</b>	<b>Title</b>	<b>Status / End Date</b>	<b>Project Mgr / Delivery Centre</b>	<b>Objective</b>
12qo -	Stress and Small Unit Operations	Active (31 Mar 12)	B. Fraser (Toronto)	To provide specific information as to the impact of the Afghanistan operational environment on the cognitive capabilities and decision making skills of small unit operations, including the impact of multiple physiological and psychological stresses on individual and team performance (12qo02).
<b>Thrust 12s - Land Sustain</b>				
<b>Project #</b>	<b>Title</b>	<b>Status / End Date</b>	<b>Project Mgr / Delivery Centre</b>	<b>Objective</b>
<b>12sk – Accelerated Mission Specific Training</b>				
12sk02	Exploitation of Dynamic Learning	Active (31 Mar 11)	D. Bryant (Toronto)	



**Table C1: Details on Other DRDC Personnel Research That Could Have Implications for the Navy (cont.)**

12sk03	Learning in Complex Systems	Active (31 Mar 11)	J. Jarmasz (Toronto)	To determine how to train people to handle complexity in decision making tasks using microworlds.
12sk04	Defining Complexity and Dynamic Decision Making in the CF	Active (31 Mar 11)	J. Jarmasz (Toronto)	
12sk05	Training in Dynamic Team Environments	Active (31 Mar 11)	M. Duncan (Toronto)	
12sk06	Cognition of Dynamic Decision Making	Active (31 Mar 11)	M.E. Jobidon (Toronto)	
<b>Thrust 12t - Land Integrated Analysis</b>				
<b>Project #</b>	<b>Title</b>	<b>Status / End Date</b>	<b>Project Mgr / Delivery Centre</b>	<b>Objective</b>
12ta -	Force Generation and Sustainment (IFGAS)	Active (31 Mar 11)	M. Ormrod (CORA)	To develop and apply OR methods to analyze the Army's Force Generation process, including the ability to identify sustainability issues for current and future operations.
<b>Thrust 13p - Air Sustain</b>				
<b>Project #</b>	<b>Title</b>	<b>Status / End Date</b>	<b>Project Mgr / Delivery Centre</b>	<b>Objective</b>
13pf -	Circadian Entrainment to Counter Jet Lag and Shift Lag	Active (31 Mar 10)	M. Paul (Toronto)	To provide guidance to commanders and supervisors on how to mitigate circadian disruptions (either backwards or forwards) due to jet lag and the circadian de-synchronosis inherent in shift work.
<b>Thrust 13q - Air Command</b>				
<b>Project #</b>	<b>Title</b>	<b>Status / End Date</b>	<b>Project Mgr / Delivery Centre</b>	<b>Objective</b>
13qf -	Human Dimension of the Expeditionary Air Force	Active (31 Aug 09)	A. Febbraro (Toronto, RMC)	To improve the creation, leadership and sustainment of complex multi-functional teams in the expeditionary Air Force.

**Table C1: Details on Other DRDC Personnel Research That Could Have Implications for the Navy (cont.)**

<b>Thrust 13r - Air Analyze</b>				
<b>Project #</b>	<b>Title</b>	<b>Status / End Date</b>	<b>Project Mgr / Delivery Centre</b>	<b>Objective</b>
13rb -	Future Air Capability Options	Active (31 Mar 13)	S. Bourdon (CORA)	To inform the departmental decision making process on issues relating to the air environment, capturing analysis activities related to force structure and future equipment requirements (other than C4ISR), including the development of a model of key Air Force occupations through the upcoming transition period as the CF acquires new aircraft fleets and adjusts the existing fleets (13rb15).
<b>13re - Personnel and Force Generation</b>				
13re01	NFTC Optimal Course Loading & Student Throughput Capacity	Completed (31 Mar 09)	C. Hunter (CORA)	To provide scientific authority on a contractor's assessment of NFTC's capacity.
13re02	Basic Air Navigation Course Resource Allocation Model Development	Completed (31 Mar 09)	R. Seguin (CORA)	To develop a method of determining realistic course lengths for the Basic Air Navigation Course.
13re03	SOA & Selection Criteria and Process	Completed (31 Mar 09)	P. deJong (CORA)	To analyze the implications of the change in force structure to support the expanded SOA community, in terms of unit experience levels required and how to sustain them.
13re04	Pilot PARSim Modifications to Support Acquisition of New Aircraft Fleets	Completed (31 Mar 09)	R. Seguin (CORA)	To update the Pilot PARSim Model with current aircraft fleet values and add new aircraft fleets into the model, in order to accurately perform runs and assess whether scenarios are sustainable and result in "healthy" communities or if they cause fleets to degenerate and collapse.

**Table C1: Details on Other DRDC Personnel Research That Could Have Implications for the Navy (cont.)**

<b>Thrust 14a - Plan, Recruit, Train, Educate and Career Manage</b>				
<b>Project #</b>	<b>Title</b>	<b>Status / End Date</b>	<b>Project Mgr / Delivery Centre</b>	<b>Objective</b>
14al -	Right Person, Right Qualification, Right Place, Right Time (R4) HR TDP	Active (31 Mar 11)	S. Isbrandt (DGMPRA)	To build and demonstrate an integrated modelling and analysis software environment that provides the scientific and technological capability to simultaneously examine integrated aspects of force structure, force generation and force employment.
<b>14an – Attraction, Selection, Recruiting</b>				
<b>14an01 - Attraction</b>				
14an01-1	Support to CFRG	Active (31 Mar 10)	W. Ross (DGMPRA)	To provide ongoing GIS research and analysis support to CFRG planning and decision-making.
14an01-2	National Occupation Code - Statistical Analysis	Completed (30 May 09)	F. Larochelle (DGMPRA)	To provide location analysis of 29 civilian occupations to support ADM (HR-Civ) recruit from these occupations.
14an01-3	Prospect Survey	Active (31 Mar 12)	L. Williams (DGMPRA)	To get information from individuals who are interested in joining the CF (demographics, military experience and aspirations, advertising).
14an01-4	Applicant Survey	Active (31 Mar 12)	L. Williams (DGMPRA)	To get information from individuals who have passed the CFAT (demographics, military experience and aspirations, advertising).
14an01-5	Attracting the Best in S&T	Active (31 Mar 10)	Maj D. Scholtz (DGMPRA)	To evaluate current DRDC practices used to attract and select candidates and to propose improvements that will ensure that "the best" S&T candidates are attracted/retained by the recruitment process.
14an01-6	Civilian Labour Market Research	Active (31 Dec 12)	J. Coulthard (DGMPRA)	To review labour market factors to determine potential risk areas to DND.
<b>14an02 - Selection Tests and Standards</b>				
14an02-4	Army of Tomorrow Job Analysis	Active (31 Mar 10)	Maj C. Suurd (DGMPRA)	To identify soldier attributes and competencies, build frameworks, identify selection criteria and recommend selection instruments and procedures and training approaches.
14an02-5	AEC Spatial Ability and Situation Awareness Testing	Completed (31 Mar 09)	C. Burgess (DGMPRA)	To identify measures to assess spatial ability and situational awareness for Air Ops occupations.

**Table C1: Details on Other DRDC Personnel Research That Could Have Implications for the Navy (cont.)**

14an02-7	CF Instructor Attributes	Active (31 Mar 10)	Maj C. Suurd (DGMPRA)	To recommend assessment techniques & selection system for role of CF instructor based on combined job analysis.
14an02-13	Personality Testing	Active (31 Mar 10)	W. Darr (DGMPRA)	To investigate the utility of adding the TSD-PI personality measure to the CF selection system.
14an02-14	Biodata Measure	Active (31 Mar 11)	K. Piasentin (DGMPRA)	To investigate the usefulness of a biodata measure for out-service & in-service use based on current research and practices.
14an02-15	Executive Function Testing for Air Ops	Active (31 Mar 11)	Maj C. Suurd (DGMPRA)	To determine the usefulness of measures of executive functioning for air ops pers.
14an02-23	Selection Standards for the ACSO Sub-specialty: UAV Operator	New (01 Apr 12)	LCol D. O'Keefe (DGMPRA)	To develop a selection standard for members selected for this type of employment, which will require a job analysis and validation of entry standards.
<b>14an03 - Recruiting</b>				
14an03-1	Optimal Location of Recruit Centres	Active (31 Mar 12)	W. Ross (DGMPRA)	To provide location analysis of recruiting centres and areas of responsibility for selection of future recruiting locations.
14an03-2	Recruitment Study	Active (31 Dec 10)	N. Otis (DGMPRA)	To examine the recruitment process with a focus on individual differences associated with reasons for leaving the process. This study will also examine the issue of recruit quality, as requested by DGMP in spring 09.
14an03-4	Visible Minorities Recruiting	Active (31 Mar 13)	P. Browne (DGMPRA)	To examine visible minorities' perception of, and interest in the CF in order to fully understand their reluctance to join; and to create a change process that will make the CF a viable alternative career choice for young adults.
14an03-5	Recruit Medical Screening Process	New (31 Mar 12)	Maj D. Scholtz (DGMPRA)	To decrease the attrition of recruits and members based on improved medical screening processes.
14an03-6	Assessment of CF Strategies to Attract and Recruit Aboriginals and Visible Minorities	New (31 Mar 12)	J. Dunn (DGMPRA)	To assess the effectiveness of CF strategies for attracting and recruiting Aboriginals and Visible Minorities.
<b>14an04 – Applicant Database</b>				
14an04-1	Applicant Database Conversion	Active (31 Mar 12)	A. Berthiaume (DGMPRA)	To migrate the Applicant Database to a more modern environment for better efficiency and effectiveness in maintaining and exploiting the data.

**Table C1: Details on Other DRDC Personnel Research That Could Have Implications for the Navy (cont.)**

<b>14ao - Training and Education Systems</b>				
<b>14ao01 - Basic Training List (BTL)</b>				
14ao01-1	BTL Analysis Using the PMT	Active (31 Mar 12)	M. Straver (DGMPRA)	To use the PMT to model the training pipeline of an occupation so that the current and future state of the pipeline can be determined. Existing or arising scheduling problems can be identified and "what if" analysis can be performed.
14ao01-2	Personnel Generation Performance Measurement	Active (31 Mar 12)	M. Straver (DGMPRA)	To provide visibility on the effectiveness and efficiency of the personnel generation system from recruit application to achievement of the Operationally Functional Point.
<b>14ao02 - Advanced Training</b>				
14ao02-1	IT&E Strategy (Gap Analysis)	Active (31 Mar 12)	D. Pelchat (DGMPRA)	To review Canadian Forces College programs to assess suitability of current pedagogy and related approaches for adult education.
14ao02-2	AERE Post Graduate Training	Active (31 Mar 10)	G. Christopher (DGMPRA)	To resolve the problem of under-utilization of AERE post graduate training.
<b>14ao03 - Education</b>				
14ao03-1	Impact of SLT Removal from Development Period (DP) 1	Active (31 Mar 11)	S. Latchman (DGMPRA)	To analyze the impact of removing SLT from DP1 on promotion prospects, demographics, attrition and retention (if possible to ascertain), SLT training needs in the future and/or availability of bilingual personnel for bilingual mandatory positions.
<b>14ao04 - Learning Technologies</b>				
14ao04-1	Evaluation of DND Mentoring Program	Active (30 Jun 11)	J. Coulthard (DGMPRA)	To conduct a formative evaluation of the DND Mentoring Program, examining program rationale, design, implementation and progress in meeting program goals.
<b>14ap - Career Manage and Employ</b>				
<b>14ap01 - Performance Appraisal</b>				
14ap01-1	CFPAS Replacement Project	Active (31 Mar 12)	L. St Pierre (DGMPRA)	To provide research capability and expertise to DGMP in the development on a new CFPAS.

**Table C1: Details on Other DRDC Personnel Research That Could Have Implications for the Navy (cont.)**

14ap01-2	Promotion and Retention of Visible Minorities in the CF	Active (30 Dec 11)	P. Browne (DGMPRA)	To conduct research into the promotion and retention process as it relates to individuals in visible minority groups to determine whether there are barriers in the process that may have an impact on attrition in these groups.
14ap02 – Succession Planning				
14ap04-1	Standardization of Succession Planning Initiatives	Active (31 Mar 11)	L. St Pierre (DGMPRA)	To standardize succession planning initiatives across the three environments and purple occupations, with the aim to better prepare future leaders for promotion to higher ranks.
14ap04 - Sustainment				
14ap04-1	Readiness and Sustainment Modelling and Analysis	Active (31 Mar 10)	M. Halbrohr (DGMPRA)	To develop a simulation model that can be used to examine the ability of the CF to sustain operations for a HR perspective.
14aq - Retention and Release				
14aq01 - Retention				
14aq01-1	Retention of Reg F by Transfer to Res F	Active (31 Mar 12)	G. Christopher (DGMPRA)	TBD
14aq01-2	ADM HR-Civ Exit Survey Pilot Study	Active (31 Jul 10)	S. Lalonde (DGMPRA)	To identify the main predictors of voluntary attrition, measure employee's perceptions of their work experience at DND, determine the feasibility of establishing and maintaining a department-wide civilian exit survey, and identify potential retention interventions.
14aq01-4	CF Exit Survey	Active (31 Mar 13)	K. Michaud (DGMPRA)	To identify key factors associated with voluntary attrition. This survey is given to all Reg F members who are leaving the CF voluntarily. This information may be used to examine policy, training, and employment of personnel to address issues that may assist in enhancing retention within the CF.

**Table C1: Details on Other DRDC Personnel Research That Could Have Implications for the Navy (cont.)**

14aq01-5	CF Retention Survey	Active (31 Mar 13)	N. Holden (DGMPRA)	To identify key factors associated with retention. This survey is administered bi-annually to military occupations identified for surveying based on their attrition trends. This survey is part of the CF Retention Strategy, which aims at strengthening the social contract through transactional (pay, benefits and other tangibles) and relational (commitment, job/career satisfaction, organizational support) measures.
14aq01-10	Retention Survey – Analysis for Support Occupations	New (31 Mar 11)	S. Latchman (DGMPRA)	TBD
14aq01-11	Retention Survey – Other Analysis (i.e. correlation between engagement and commitment scales)	New (31 Mar 11)	S. Latchman (DGMPRA)	TBD
14aq02 - Attrition				
14aq02-1	Attrition Forecasting Methodology	Active (31 Mar 13)	M. Fang (DGMPRA)	To conduct research into the methodological approaches to: 1) reporting and forecasting attrition; 2) detecting changes in attrition patterns; 3) providing confidence intervals for attrition projections (systematic review).
14aq02-2	Attrition Reporting and Forecasting	Active (31 Mar 13)	S. Latchman / M. Fang (DGMPRA)	To conduct applied attrition analyses as required, including annual support to AMORs.
14aq02-3	Impact of TFA on Attrition	Active (31 Mar 13)	M. Fang (DGMPRA)	To compare the release patterns between the general CF populations and those returning from TFA.
14aq02-4	Ad Hoc Attrition and Retention Analysis	Active (31 Mar 12)	S. Latchman (DGMPRA)	To provide attrition and retention analysis on an ad-hoc basis.
14aq02-5	BMQ Attrition Analysis	Active (31 Mar 11)	K. Michaud (DGMPRA)	To provide DGMP and CFLRS with accurate information on attrition during BMQ training.
14aq02-6	Attrition in the Civilian Workforce: A 10 Year Overview of Attrition Data and Forecasting Trends	New (31 Mar 11)	S. Latchman (DGMPRA)	To analyze attrition data between 2005-2009 by occupational group and level, and compare to baseline measure (1999-2004) in order to identify groups with highest attrition rates and provide information (characteristics) of those departing compared to the average population.

**Table C1: Details on Other DRDC Personnel Research That Could Have Implications for the Navy (cont.)**

14aq03 - Measurement and Reporting				
14aq03-1	Develop Annual Report on CF Attrition	Active (31 Mar 12)	M. Straver (DGMPRA)	To develop an Annual Report on CF Attrition, which will be similar in structure to the Annual Report on Reg F Personnel, but will deal exclusively with attrition.
14ar - Human Resource Planning				
14ar01 - Strategic Level				
14ar01-1	Force Generation Modelling and Analysis	Active (31 Mar 12)	G. Christopher (DGMPRA)	To support process and analysis tool development to stand up Generate capability domain in CFD.
14ar01-2	Force Structure Review	Active (31 Mar 12)	G. Christopher (DGMPRA)	To provide HR Modelling and Analysis support to the CF Force Structure Review as required.
14ar01-3	Aging of CF Workforce	Active (31 Mar 10)	S. Latchman (DGMPRA)	To provide modelling and analysis to address issues and concerns with the aging CF demographics.
14ar01-4	Reg F Personnel Reporting	Active (31 Mar 12)	M. Straver (DGMPRA)	This highly visible CMP report is produced on an annual basis. It presents a variety of information on the CF Reg F, including (but not limited to) demographic data for the past 20 years, historical attrition data and attrition forecasts.
14ar01-5	CAS Establishment Study	Active (31 Mar 13)	S. Latchman (DGMPRA)	To quantify the current Air Force establishment requirements.
14ar01-6	Multi-disciplinary Methods	Active (31 Mar 12)	M. Halbrohr (DGMPRA)	To assess and develop integrated multi-disciplinary methods for HR research.
14ar02 - Occupational Level				
14ar02-1	Annual Military Occupational Reviews	Active (31 Mar 12)	G. Christopher (DGMPRA)	To provide modelling and analysis to support AMORs; develop a tool which can be used by stakeholders to quickly explore the impact on queues and production of various recruitment and course capacity scenarios; and conduct analysis & provide support as required.
14ar02-2	CF Force and Occupational Structure Modelling and Analysis	Active (31 Mar 12)	M. Straver (DGMPRA)	To provide modelling and analysis support to CF occupations / organizations in order to analyze the impact of changes in HR policies and organizational structure on their workforce.



**Table C1: Details on Other DRDC Personnel Research That Could Have Implications for the Navy (cont.)**

14ar02-3	Civilian Workforce Modelling and Analysis	Active (31 Mar 12)	M. Halbrohr (DGMPRA)	To conduct workforce analysis on civilian demographics and career flows in support of stand alone analyses as well as defining the input parameters for modelling; and develop a model of civilian workforce career flow.
14ar02-9	SPQR Research Project	New (1 Jun 10)	G. Christopher (DGMPRA)	To have DMPORA make a comparison of existing SPQRs associated with positions and a comparison of qualifications held by incumbents of those positions for the entire CF.
14ar03 - Organizational Level				
14ar03-1	Assessing Establishment Requirements for Canada Command HQ	Active (31 Dec 09)	F. Larochelle (DGMPRA)	To develop a methodology in order to help Canada Command assess its HQ's preferred manning level.
14ar05 - Database Support				
14ar05-1	Build and Maintain Internal Historical Databases	Active (31 Mar 12)	A. Berthiame (DGMPRA)	To build, improve, maintain and update data stores that are used for workforce modelling and analysis. Key databases include those containing fiscal and calendar year Reg F Populations and Releases (back to 1982).
14ar05-2	Ad Hoc Workforce Modelling and Statistical Analysis	Active (31 Mar 12)	G. Christopher (DGMPRA)	To provide Workforce Modelling and Statistical Analysis on an ad-hoc basis.
14as - Future Selection				
14as02 - Tests				
14as02-1	CFAT Validation	Active (31 Mar 12)	LCol D. O'Keefe (DGMPRA)	To validate the CFAT against training performance for five CF Job Families on a rotational basis. The goal is to conduct at least one predictive validation study for one occupation per family. The CFAT cut-off scores will also be validated using the Angoff method.
14as02-2	COGSCREEN Predictive Validity Analysis	Active (31 Mar 11)	LCol D. O'Keefe (DGMPRA)	To determine the usefulness of COGSCREEN data in predicting performance in pilot training.

**Table C1: Details on Other DRDC Personnel Research That Could Have Implications for the Navy (cont.)**

14as03 - Technology				
14as03-1	New Selection Testing Technology	Active (31 Mar 12)	Maj. D. Scholtz (DGMPRA)	To design and develop new selection and assessment measures for CF applicants and in service selection. This project will include the identification of constructs that should be measured and the technologies or platforms to administer the tests.
14av -	Advanced E-Learning Technologies	Active (31 Mar 12)	M. Hou (Toronto)	To develop a more effective learning environment using adaptive learning and intelligent tutoring technologies. By using this type of learning environment the time needed for a student to complete a course will be decreased, students will obtain better results and the cost to manage and implement a course will be reduced.
<b>Thrust 14b - Prepare, Support, Honour and Recognize</b>				
<b>Project #</b>	<b>Title</b>	<b>Status / End Date</b>	<b>Project Mgr / Delivery Centre</b>	<b>Objective</b>
14bj - Prepare				
14bj01 - Health				
14bj01-1	Blind Drug Testing	Active (31 Mar 12)	K. Sudom (DGMPRA)	To obtain situational awareness of the extent of unauthorized drug usage at the unit or sub-unit level so that the requirement for changes in the drug control programs or policies can be evaluated on the basis of factual information.
14bj01-2	Pan CF Random Drug Testing	Active (31 Mar 10)	K. Sudom (DGMPRA)	To estimate the prevalence of illicit drug use among the CF full time personnel. This is a one time testing that cuts across all CF members.
14bj01-3	Personality and Psychological Well-being of New Recruits	Active (31 Oct 10)	A. Skomorovsky (DGMPRA)	To examine the role of personality traits and coping strategies in drug usage among military personnel.
14bj01-4	Recruit Health Questionnaire	Active (1 Feb 10)	J. Lee (DGMPRA)	To develop a survey, and use it to identify predictors of recruit training success and attrition and to identify trends.

**Table C1: Details on Other DRDC Personnel Research That Could Have Implications for the Navy (cont.)**

14bj01-5	Health and Lifestyle Survey	Active (1 Jul 10)	C. Dubiniecki / R. Hawes (DGMPRA)	This survey is sent out every two years as of 2008 to assess physical and mental health, the prevalence of behavioural risk factors, the utilization of previous health promotion programs and potential for future programs, as well as health care utilization and satisfaction with the CF health care system among the CF Reg F and Reservists.
14bj01-6	Mental Health and Stigma in the CF	Active (1 Jul 10)	C. Dubiniecki / R. Hawes (DGMPRA)	To determine the degree of stigma associated with utilizing mental health services in the CF, and the extent to which such stigma is a barrier to seeking mental health care.
14bj01-7	Deployment Characteristics Related to Post-Deployment Mental Health Outcomes	New (31 Mar 11)	K. Sudom (DGMPRA)	To identify/define key characteristics of deployments acting as potential stressors and their relationship with post-deployment mental health outcomes and to draw conceptual parallels with cognitive appraisal theories of stress.
14bj01-8	Psychological Well-Being in the CF	New (1 Dec 10)	J. Dunn (DGMPRA)	To develop a conceptual framework for promoting psychological well-being in the CF.
14bj01-9	Risk-taking Propensity and Behaviour in CF Recruits and implications for their Military Career	New (1 Jan 10)	K. Sudom (DGMPRA)	To examine risk-taking propensity and behaviour in military recruits and determine their relationship with unintentional injuries cross-sectionally and prospectively..
14bj02 - Fitness				
14bj02-1	Conceptual Model for Health and Fitness	Active (31 Mar 10)	Z. Wang (DGMPRA)	To review the pertinent literature and develop an integrated model which helps the CF to promote a healthy and fit force.

**Table C1: Details on Other DRDC Personnel Research That Could Have Implications for the Navy (cont.)**

14bj02-2	Participation in the CF Sports Program	New (31 Mar 11)	K. Sudom (DGMPRA)	To determine if participation in the CF Sports Program has any influence on recruitment of new personnel in the CF; to determine if participation in the CF Sports Program has an impact on the retention/attrition rates of CF personnel; to determine if participation in sports contributes to the improvement and maintenance of a CF member's fitness level; and to determine any physical or perceived benefits of CF members from participation in the CF Sports Program.
14bj03 - Spiritual				
14bj03-1	Servant Leadership	Active (30 Apr 10)	B. Doan (DGMPRA)	To examine the concept of "servant leadership", where the leader is not there to be served, but instead is there to serve those below him/her. Basic research questions include what is servant leadership and how can it be applied in the Chaplain Branch.
14bj03-3	Spiritual and Social Well-being	Active (30 Sep 10)	J. Dunn (DGMPRA)	To gain a further understanding of what spiritual and social well-being are.
14bk - Personnel and Family Support				
14bk01 - Perstempo/Optempo				
14bk01-1	Deployment Policies & Practices Across TTCP Nations	Active (31 Mar 10)	S. Dursun (DGMPRA)	To benchmark the deployment policies/practices across TTCP nations.
14bk02 - Casualty				
14bk02-2	Care to the Ill and Injured - Survey and Follow-on Research	New (31 Mar 11)	K. Sudom / J. Lee (DGMPRA)	To investigate issues connected to the management and employment of injured members.
14bk02-3	Injury Surveillance	Active (31 Mar 12)	J. Lee (DGMPRA)	To examine the psychosocial and occupational factors predicting injury-related disability.
14bk02-4	Care of Ill and Injured CF Personnel	New (1 Aug 11)	K. Sudom (DGMPRA)	To investigate issues connected with the care, management and employment of ill and injured CF personnel.

**Table C1: Details on Other DRDC Personnel Research That Could Have Implications for the Navy (cont.)**

14bk03 - Transition				
14bk03-1	VAC/DND Transition Study	Active (31 Mar 12)	K. Sudom (DGMPRA)	To determine the health (physical, mental and social well-being) indicators of CF members after transition from military to civilian life; to determine whether these indicators change over time; and to examine how the indicators compare between VAC clients and non-clients.
14bk04 - Family				
14bk04-3	CF Individual Accommodation Requirement Study	Active (31 Mar 11)	I Dekker / S Dursun (DGMPRA)	To provide a baseline for the DND single quarters accommodation conditions to aid in the development of an accommodation Way Ahead for a future accommodation strategy.
14bk04-5	Economic Impact and Determinants of Military Life on Spousal Employment	Active (31 Oct 10)	J. Dunn (DGMPRA)	To explore the economic impact and determinants of military life on spousal employment.
14bk04-6	Childcare & Caregiver Study	Active (31 Mar 11)	S Dursun (DGMPRA)	To identify childcare needs unique to CF military families (needs of families with special needs children; availability and gap analysis; current usage; funding and affordability assessments; links to operational readiness/effectiveness).
14bk04-7	Collaboration with US Deployment Health Research Center	Active (31 Mar 11)	S Dursun (DGMPRA)	To collaborate with the US Center for Deployment Health Research on the development of the military family cohort study (to be done with US military families). This would give us an opportunity to benchmark our findings on CF families.
14bk04-8	Imposed Restriction: The Impact on Families	Active (31 Mar 10)	S Dursun (DGMPRA)	To examine the impact of the IR on the well-being of the families of military personnel.
14bk04-9	Second Administration of Spousal Quality of Life Survey	Active (31 Mar 11)	S Dursun (DGMPRA)	To measure the impact of PERSTEMPO and other factors on CF families in terms of individual and family well-being/QOL.
14bk04-10	Well-being of Reservists' Families	Active (31 Mar 12)	S Dursun (DGMPRA)	To examine the key factors of the CF lifestyle that have an impact on the well-being of families of CF Reservists and the links to retention among reservists.

**Table C1: Details on Other DRDC Personnel Research That Could Have Implications for the Navy (cont.)**

14bk05 - Compensation and Benefits				
14bk05-1	Strategic Assessment of Compensation and Benefits/Total Rewards Model	Active (31 Mar 12)	J. Dunn / S. Dursun (DGMPRA)	To examine the current approach to CF compensation and benefits (Regular and Reserve), including the implications of compensation and benefits policies for recruiting and retention. Aspects to consider are: what are the unanticipated organizational effects of current approach? does CF realize a Return on Investment? are pay and benefits meeting the needs of the member and of the goals of the organization? Proposals for a new/revised compensation model for the CF will be made.
14bk05-2	Impact of Compensation and Benefits on Recruiting and Retention	Active (31 Dec 09)	Z. Wang / J. Dunn (DGMPRA)	To determine how compensation and benefits should fit into retention strategies and the impact of retention bonuses; similarly the impact and effectiveness of recruiting bonuses and the return on investment will be examined.
14bk05-3	Evaluation of the Pension Program	Active (31 Mar 12)	S. Dursun / J. Dunn (DGMPRA)	To evaluate current pension policy. Are the policies doing what they are supposed to do now? What sort of changes would members be interested in the future? The survey will also evaluate awareness of the new pension policy following the communications program to take place in Jun 09. Both Regular and Reserve pension policy to be evaluated. Another objective of this study is to determine what other militaries are offering with regards to pensions.
14bk05-4	International Benchmarking	TBD	J. Dunn / Z. Wang (DGMPRA)	Further Scoping Required. DGCB has suggested this could be undertaken every 4 years, under an MOU, with rotating responsibilities, e.g. by Canada next time. They are interested in obtaining data from UK and having the report "Canadianized" from this data.

**Table C1: Details on Other DRDC Personnel Research That Could Have Implications for the Navy (cont.)**

14bk05-5	Evaluation of the CF IRP	Active (31 Mar 12)	S. Dursun (DGMPRA)	To evaluate the CF IRP and to develop a stratified sampling framework. DGCB would like to broaden the project, to include issues related to the dynamic of moving families.
14bk05-6	Adequacy of PTE/LT Salaries in High Cost of Living Areas	New (TBD)	S. Dursun (DGMPRA)	To possibly use salary data from StatsCan (spousal research) to examine PTE and LT salaries in high cost areas.
14bk05-7	Long Term Impact of IR on CF Personnel and Their Families	Active (31 Mar 10)	J. Dunn (DGMPRA)	To examine the impact of the IR on the well-being of the families of military personnel.
14bk06 – The Social Contract				
14bk06-1	Community Wellness	New (31 Mar 12)	S. Dursun (DGMPRA)	To conduct a review of the literature on military community wellness and to develop a reliable and valid military community wellness measure.
14bk06-2	Duty to Care	New (31 Dec 12)	J. Dunn (DGMPRA)	To further our understanding of what Duty to Care entails.
14bk06-3	The Benefits of the Canadian Forces Recreation Program	New (31 Mar 11)	S. Dursun (DGMPRA)	To determine the accuracy of the benefit impact statements for the CF community and determine if there are other benefits specific to the military community; to determine the current levels of participation and general interest in some of the program areas; to determine the barriers to participation in the CF Recreation Program; and to determine the program format of participation in recreation programming that has the largest impact on military personnel, the family and the larger community.
14bl - Workplace Wellbeing				
14bl01 – Official Languages				
14bl01-1	Official Languages Program Transformation Model Survey	Active (31 Mar 13)	K. Daley (DGMPRA)	To assess the effectiveness of the Official Languages Program Transformation Model.
14bl02 - Diversity				
14bl02-2	EE Monitoring for ADM(HR-Civ)	Active (31 Dec 12)	S. Lalonde (DGMPRA)	To provide EE representation reports for Deputy Minister (DM), L1, L2, L3 organizations - semi annually; to analyze EE mobility data (hires, promotions and separations) for DM and L1 organizations annually.

**Table C1: Details on Other DRDC Personnel Research That Could Have Implications for the Navy (cont.)**

14bl02-3	Future Directions in Training & Commitment	Active (31 Mar 11)	P. Browne (DGMPRA)	To enhance the capability of EE officers to support the chain of command in implementing their EE plans.
14bl02-4	Civilian EE Employment Systems Review	Active (31 Oct 10)	S. Lalonde (DGMPRA)	To identify systematic barriers affecting designated group members, ensure that DND operates within non-discriminatory policies and practices, and provide recommendations for the EE plan.
14bl02-5	Civilian Diversity Climate Survey	Active (30 Sep 11)	S. Lalonde (DGMPRA)	To monitor employee attitudes and perceptions towards diversity and EE, measure the prevalence of workplace discrimination, examine issues regarding workplace accommodation.
14bl03 - Alternate Dispute Resolution (ADR)				
14bl03-1	Awareness and Knowledge Transfer of ADR Training	Active (31 Mar 10)	I. Dekker (DGMPRA)	To update the survey used previously to gauge awareness and transfer of knowledge/skills from ADR training.
14bl03-2	Performance Measurement Study on ADR	Active (30 Apr 10)	J. Dunn (DGMPRA)	To examine ADR policies/practices in other government and military organizations, similar to the TTCP paper previously done on grievance and complaint mechanisms.
14bl03-3	Effectiveness of Harassment Policy	New (TBD)	S. Dursun (DGMPRA)	TBD
14bm - Honour and Recognize				
14bm01 - Honour				
14bm02-1	What Forms of Recognition Are Important Today	Active (30 Sep 10)	MS Paguin (DGMPRA)	To analyze what is important to today's workforce, exploring motivational factors, generational differences, and best practices used in "employer of choice" organizations.



**Table C1: Details on Other DRDC Personnel Research That Could Have Implications for the Navy (cont.)**

<b>Thrust 14c - Individual, Operational and Organizational Effectiveness</b>				
<b>Project #</b>	<b>Title</b>	<b>Status / End Date</b>	<b>Project Mgr / Delivery Centre</b>	<b>Objective</b>
<b>14ca - Cultural Intelligence, Command Leadership and War</b>				
<b>14ca01 – Cultural Intelligence</b>				
14ca01-1	Cultural Intelligence (CQ)	Active (31 Mar 12)	K. Davis (DGMPRA)	To identify the competencies, activities, models and strategies that are essential to the development of CQ; and to determine priorities for measurement of leadership and CQ.
14ca01-2	Army Culture Survey	Active (31 Mar 10)	L. Stemate (DGMPRA)	To conduct a second administration of the survey in 2009, including additional items that will address emerging Army Culture and Climate concerns.
14ca01-4	Warrior Culture and Soldier Identity	New (31 Mar 12)	LCol Martineau (DGLS)	To determine the role of Social Capital in defining soldier identity and how elements of Social Capital contribute to physical and moral resiliency and future employment concepts.
<b>14ca02 – CF Leader Development</b>				
14ca02-1	CF Leader Development	Active (31 Mar 12)	K. Davis (DGMPRA)	To identify the range of challenges, opportunities, and strategies that are relevant priorities for development of CQ among senior leaders in defence and security environments.
<b>14cb - Psychological Resiliency</b>				
<b>14cb02 – Resiliency After Capture</b>				
14cb02-1	Resiliency After Capture	Active (31 Mar 12)	Maj J. Klammer (CDA)	To develop lesson plan and experimentation for the CAC training center to enhance pre-deployment preparation and training for high risk operations.
<b>14cb04 – Post Deployment Reintegration Adaptation</b>				
14cb04-1	PDR Adaptation	Active (31 Mar 12)	D. McCreary (Toronto)	To study the process of PDR over a 12-month period by assessing individual, interpersonal, and organizational factors well-being monthly. Focus on comparing Reg F and Res F personnel.

**Table C1: Details on Other DRDC Personnel Research That Could Have Implications for the Navy (cont.)**

<b>14cb05 – Home Leave Travel Authority Experiences</b>				
14cb05-1	HLTA Experiences	Active (31 Mar 12)	D. Pickering (Toronto)	To employ both qualitative and quantitative methods to examine the HLTA experience and associated impact on people's well-being and organizational commitment, with a focus on suggesting improvements to the process.
<b>14cb06 – Post Deployment Reintegration in Injured CF Personnel</b>				
14cb06-1	PDR in Injured CF Personnel	Active (31 Mar 12)	D. McCreary (Toronto)	To focus on the PDR experiences of CF personnel physically injured while deployed to Afghanistan.
<b>14cb07 – Adaptation in Augmentees</b>				
14cb07-1	Adaptation in Augmentees	Active (31 Mar 12)	M. Thompson (Toronto)	To continue a longitudinal study of the health and well-being of personnel who deploy to Afghanistan as an augmentee. They are assessed pre-deployment, mid-deployment, and post-deployment.
<b>14cg - Team Effectiveness in Collaborative Operations</b>				
<b>14cg02 – Factors Underpinning Role Adoption and Team Mental Models</b>				
14cg02	Factors Underpinning Role Adoption and Team Mental Models	Active (31 Mar 12)	M. Duncan (Toronto)	To identify the cognitive, social, and organizational factors that create effective team mental models and the subsequent impact on team agility.
<b>14cg03 – Effectiveness in the Operational Readiness Envelope</b>				
14cg03	Effectiveness in the Operational Readiness Envelope	Active (31 Mar 12)	M. Duncan (Toronto)	To understand the characteristics of team mental models and agility required to be effective across the breadth of the operational readiness envelope.
<b>14cg04 – Training Requirements</b>				
14cg04	Training Requirements	Active (31 Mar 12)	M. Duncan (Toronto)	To provide guidance and advice on individual and team training that will facilitate development of an optimally agile force.
<b>14ch - Alternative Training Delivery and CF Socialization: Impacts and Opportunities</b>				
<b>14ch01 – Alternate Training Delivery: Impact on Early Socialization of CF Members</b>				
14ch01-1	Alternate Training Delivery: Impact on Early Socialization of CF Members	Active (31 Mar 12)	J. Wright (DGMPPRA)	Determine impact of alternative training delivery (training provided by other than CF schools) on early socialization of CF members, including development of military ethos.

**Table C1: Details on Other DRDC Personnel Research That Could Have Implications for the Navy (cont.)**

14ci – Interagency Trust				
14ci01 – Integrative Literature Reviews and Conceptual Model Design of Interagency Trust				
14ci01-1	Integrative Literature Reviews and Conceptual Model Design of Interagency Trust	Active (31 Mar 10)	M. Thompson (Toronto)	To develop an integrative literature review and a conceptual model of interagency trust.
14ci02 – SME Feedback and Lessons Learned Integration/Development of Interagency Trust				
14ci02-1	SME Feedback and Lessons Learned Integration / Development of Interagency Trust	Active (31 Mar 10)	M. Thompson (Toronto)	To interview CF personnel who have deployed on prior operations involving interagency components to compile best practices and lessons learned to enhance interagency trust.
14ci04 – Recommendations for CF/Interagency Training and Education Applications				
14ci04-1	Recommendations for CF / Interagency Training and Education Applications	Active (31 Mar 12)	M. Thompson (Toronto)	To conduct literature reviews to develop recommendations for training and education options that support the development of interagency trust.
14ci05 – Integrating Lessons Learned into IT&E				
14ci05-1	Integrating Lessons Learned into IT&E	Active (31 Mar 10)	G. Scoppio (CDA)	To conduct a systemic and systematic analysis of the process by which lessons learned are efficiently and effectively integrated into IT&E in the CF.
14cj - Operational Effectiveness				
14cj02 - Human Dimension Assessment In Operations				
14cj02-2	HDO Survey for Small Missions	Active (1 Jun 10)	Cdr S. McMillan (DGMPRA)	To gain insight into the attitudes and perceptions of personnel deployed on all CF missions except those in Afghanistan.
14cj02-7	Development and Validation of an International HDO Model	Active (1 Jun 11)	Maj G. Ivey (DGMPRA)	To lead an international group of researchers toward the development of an internationally agreed upon HDO model, against which other militaries can measure their own respective models.
14cj02-10	Mediating Effect of Trouble/Concern on Relationship Between Stress and Strain	Active (31 Mar 10)	H. McQuaig-Edge (DGMPRA)	To better understand the relationship between operational stressor frequency and clinical strain by examining the mediating effect of one's assessment of the stressor.
14cj02-11	Attitudes Towards Length of Pre-Deployment Training and Length of Tour	Active (31 Mar 10)	M. Therrien (DGMPRA)	To provide CMP with a current assessment of deployed personnel's attitudes toward the length of pre-deployment training and length of tour.

**Table C1: Details on Other DRDC Personnel Research That Could Have Implications for the Navy (cont.)**

14cj02-12	Effect of Operations in Afghanistan on Career Intentions	New (14 May 10)	M. Therrien (DGMPRA)	To understand the impact of operations on CF members' future career intentions.
14cj02-13	Effect of Operations in Afghanistan on Organizational Commitment	New (31 Aug 10)	M. Therrien (DGMPRA)	To better understand the impact of operations in Afghanistan on members' organizational commitment.
14cj02-14	Examination of Strain Across the Deployment Cycle	New (31 Aug 10)	H. McQuaig-Edge (DGMPRA)	To longitudinally explore how strain fluctuates in individuals across the Afghanistan deployment cycle.
14cj02-20	Unit Climate Profile – 2nd Generation Development and Validation	Active (30 Jul 10)	Maj G. Ivey (DGMPRA)	To develop and validate an alternative to the current UCP (measure of morale, cohesion, and confidence in leadership); one that is more congruent with current research and operational demands.
14cj02-21	Validation of K-10 Strain Risk Categories within TFA Populations	Active (30 Sep 10)	Maj G. Ivey (DGMPRA)	To validate the K-10 strain risk categories currently employed within the HDO in order to be aligned with DGHS' assessment of mental health issues prevalent in soldiers deployed in Afghanistan.
14cj02-23	The Effects of Cynicism in HDO Survey Responses	Active (25 Feb 11)	Maj G. Ivey (DGMPRA)	To determine if patterns of less favourable reporting identified in HDO data analyses is due, in part, to cynicism.
14cj02-24	Understanding Morale Climate Scale Results	Active (30 Jun 10)	Cdr S. McMillan (DGMPRA)	To develop a better understanding of the patterns of reporting seen thus far in the HDO Morale Climate Scale, using Ethics Theory, with a view to completely aligning attitudes / responses with CF values..
<b>14cj03 – Organizational Influence</b>				
14cj03-1	Fmn 2021 Functional Analysis	Active (31 Jan 10)	Maj C. Suurd (DGMPRA)	To identify the kind of HR capital that JIMP enabled tactical level Fmn HQs will need to possess in the FSE.
14cj03-3	Functional Job Analysis of Key HQ Positions	Active (31 Mar 12)	Maj C. Suurd (DGMPRA)	To conduct a functional job analysis of key Fmn 2010 HQ positions.
14cj03-6	AoT Fmn 2021 Study	Active (31 Mar 11)	M. Tremblay (DGMPRA)	To monitor human dimensions affecting organizational effectiveness of the Formation, with 2RCR as the focal unit.
<b>14ck - Organizational Effectiveness</b>				
<b>14ck01 - Assessment of Policy</b>				
14ck01-1	Your-Say Fall 2007	Active (31 Jan 10)	S. Urban (DGMPRA)	Semi-annual survey of CF Regular Force members on general attitudes and opinions. Focus sections on CF Retention and Fairness; Official Languages.

**Table C1: Details on Other DRDC Personnel Research That Could Have Implications for the Navy (cont.)**

14ck01-2	Your-Say Spring 2008	Active (31 Jan 10)	S. Urban (DGMPPRA)	Semi-annual survey of CF Regular Force members on general attitudes and opinions. Focus section on Military Family Resource Centres.
14ck01-3	Your-Say Fall 2008	Active (31 Aug 10)	S. Urban (DGMPPRA)	Semi-annual survey of CF Regular Force members on general attitudes and opinions. Focus section on spousal employment and income.
14ck01-4	Your-Say Spring and Fall 09	Active (30 Nov 10)	M. Yelle (DGMPPRA)	Semi-annual survey of CF Regular Force members on general attitudes and opinions. Focus section on housing/accommodations in Spring 2009 survey; potentially career management in Fall 2009 survey.
14ck01-5	Your-Say Trend Analysis	Active (1 Sep 10)	M. Yelle (DGMPPRA)	To merge all Your-Say databases from the past five years and provide a detailed trend analysis of changed attitudes and opinions.
14ck01-7	DND Your-Say Survey	Active (31 Dec 12)	J. Coulthard (DGMPPRA)	1) To provide empirical data on employees' attitudes, perceptions, experiences, and workplace behaviours; 2) To establish baseline indicators and monitor progress; 3) To provide a vehicle for investigating specific issues of import as they arise in a timely manner.
14ck01-8	Defence Ethics Survey	Active (31 Mar 12)	K. Fraser (DGMPPRA)	2007-08 administration of the Defence Ethics Survey will assess the organization's ethical climate. Primary Reserve Survey 2008 in progress.
14ck01-11	Annual Employee Survey (Treasury Board Secretariat)	New (31 Mar 11)	J. Coulthard (DGMPPRA)	The PSES is an employee survey administered to all personnel across the Federal Government seeking their opinions and perceptions regarding their work and workplace.
14ck03 – Assessment of Structures and Organization				
14ck03-2	CFRG Future Recruiting Concepts Environmental Scan	Active (30 Jun 10)	L. Grandmaison (DGMPPRA)	To deliver overview of factors and drivers of future recruiting practices and methodologies.
14ck03-3	Strategic Analysis of Attraction/Recruiting	Active (31 Mar 10)	W. Ross (DGMPPRA)	The Strategic Open Source Info Support (SOSIS) is a standing capability that continuously monitors the external environment to identify and report on issues and situations that could effect strategic military personnel planning and decision-making.

**Table C1: Details on Other DRDC Personnel Research That Could Have Implications for the Navy (cont.)**

14ck03 – Assessment of Structures and Organization				
14ck03-5	Implications of Neo-Capital Theories on HR Management in the CF	Active (31 Mar 12)	Z. Wang (DGMPRA)	To explore the implications of neo-capital theories on military personnel management. This will include an examination of social capital theory and its impact on human well-being and QOL.
14cl – Developing a CF Portrait				
14cl01 – Data Definition and Capture				
14cl01-2	CF Portrait	Active (31 Mar 14)	K. Daley (DGMPRA)	To provide CMP with a portrait of the CF every three to five years, encompassing a range of aspects related to personnel policies and programs. Project will use a spiral approach, gathering an increasingly wide array of information, commencing with the Reg F and ultimately including the Res F.
14cl03 - Design of CF Portrait				
14cl03-2	Primary Reserve Project	Active (31 Mar 10)	K. Fraser (DGMPRA)	To study Primary Reserve members on issues related to Conditions of Service, Operational Employment, Attitudes on Leadership, Support, and Career Intentions.
14ck03-3	CF Primary Reserve Continuous Attitude Survey	New (31 Mar 11)	K. Fraser (DGMPRA)	To investigate survey non-response of key P-Res sub-groups; to develop an enhanced survey strategy for this population; and to develop content for a future continuous attitude survey.
14ck03-4	Military-Civilian Work Culture and Relations	New (31 Mar 12)	J. Coulthard (DGMPRA)	To explore the unique aspects and challenges associated with civilian personnel working in military organizations. Some aspects of the study may include: work culture and working relationships of mixed military and civilian team; issues related to workplace fairness; recognition and appreciation of the skills and contribution of civilian personnel; and military managers/supervisors' appreciation of civilian terms and conditions of employment.

**Table C1: Details on Other DRDC Personnel Research That Could Have Implications for the Navy (cont.)**

14cm – Primary Data Collection				
14cm01 – Survey Management				
14cm01-1	Survey Management	Active (31 Mar 13)	J. Bowser / P. Bender (DGMPRA)	To look into the management of survey data.
14cm03 - Partnerships				
14cm03-1	Partnerships	Active (31 Mar 13)	J. Bowser / P. Bender (DGMPRA)	To work with and develop partnerships in efforts to support primary data collection.
14cn - Geographic Information System (GIS)				
14cn03 - Methodology Development				
14cn03-3	National Occupation Code - Statistical Analysis	Completed (1 Aug 09)	W. Ross (DGMPRA)	To provide location analysis of 29 civilian occupations to support ADM (HR Civ) recruiting from these occupations.
14cn03-5	Environmental Scan Summary Report	Active (30 Sep 09)	L. Grandmaison (DGMPRA)	To publish existing environmental scan deck.
14cn04 - Partnerships				
14cn04-1	Partnerships	Active (31 Mar 12)	P. Bender (DGMPRA)	To build a client base and partners for GIS.
<b>Thrust 14d - Human Integration</b>				
<b>Project #</b>	<b>Title</b>	<b>Status / End Date</b>	<b>Project Mgr / Delivery Centre</b>	<b>Objective</b>
14da - Psycho-physiological Readiness				
14da01 – Stress Management Training in Virtual Reality				
14da01-1	Stress Management Training in VR	Active (31 Mar 11)	F. Bernier (Valcartier)	To determine the effectiveness of stress management training in a VR environment in reducing the number or severity of operational stress injuries in CF members, this enhancing the operational readiness of the CF.

**Table C1: Details on Other DRDC Personnel Research That Could Have Implications for the Navy (cont.)**

14da02 – Individual Readiness Model				
14da02-1	Individual Readiness Model	Active (31 Mar 11)	F. Buick (Toronto)	To review defence science literature to identify the major variables that would be the most important contributors to a tool for predicting individual readiness in CF members, so as to enhance their operational performance.
14db – Operational Pharmacology				
14db01 – Operational Stress and Neuro-cognitive Impairments				
14db01-1	Operational Stress and Neuro-cognitive Impairments	Active (31 Mar 10)	R. Cheung (Toronto)	To develop a theoretical model of the effects of operational stresses on pharmacokinetics and related potential effects on drug dose, drug effect, performance (cognitive and physical) and mood state.
14de - Integration with CMP Issues				
14de01 – Modelling Team Performance				
14de01-1	Modelling Team Performance	Active (31 Mar 10)	Smith (Toronto)	
14de02 – Moral and Ethical Dilemmas in CF Operations				
14de02-1	Moral and Ethical Dilemmas in CF Operations	Active (31 Mar 10)	M. Thompson (Toronto)	
14df - Capability Modelling, Simulation and Training				
14df01 – Collective Network Simulation				
14df01-1	Collective Network Simulation	Active (31 Mar 10)	S. Grant (Toronto)	To acquire and apply the know-how for effective use of local and long distance distribution simulation for collective training. (Work currently focussed on coalition air ops.)
14df02 – Simulated Operators for Networks				
14df02-1	Simulated Operators for Networks	Active (31 Mar 11)	B. Cain (Toronto)	To provide demonstration and test of the maturity of computational human behavioural modelling as a substitute for missing operations in networked training environments. <b>(Practical application is a simulation of the pilots of a maritime helicopter for training Landing Signals (aka Safety) officers the procedures involved in deck landing.)</b>



**Table C1: Details on Other DRDC Personnel Research That Could Have Implications for the Navy (cont.)**

14df03 – Sensory Cuing for Embedded and Deployed Training				
14df03-1	Sensory Cuing for Embedded and Deployed Training	Active (31 Mar 11)	L. Magee (Toronto)	To find effective ways of interfacing human operators with the networked, synthetic environments that could be afforded by network enabled systems at the battlefield.
14dh – Support to Operations – Human Integration				
14dh01 – HF Support to UAVs				
14dh01-1	HF Support to UAVs	Active (31 Mar 10)	(Toronto)	
14dj – Modelling and Simulation for Option Analysis and Requirements Engineering				
14dj02 – Manning Requirements Analysis: A Scoping Study				
14dj02-1	Manning Requirements Analysis: A Scoping Study	Active (31 Mar 10)	B. Cain (Toronto)	
14dj03 – A Software Solution for Integrated Options Analysis and Requirements Engineering				
14dj03-1	A Software Solution for Integrated Options Analysis and Requirements Engineering	Active (31 Mar 12)	B. Cain (Toronto)	
14dl - Virtual Social Networking				
14dl01 – Web-based Technology Installation and Support				
14dl01-1	Web-based Technology Installation and Support	Active (31 Mar 10)	D. Coady (Toronto)	To gain an understanding of web-based collaborative tools through data collected from user testing communities.
14dl02 – Requirements/Gap Analysis				
14dl02-1	Requirements/Gap Analysis	Active (31 Mar 12)	J. Crebolder (Toronto)	To identify military requirements for virtual social networking and for other web-based tools.
14dl03 – Virtual Social Networking and Distributed Teams				
14dl03-1	Virtual Social Networking and Distributed Teams	Active (31 Mar 12)	J. Crebolder (Toronto)	To investigate the effect of virtual social networking on teambuilding in the context of sharing information and locating sources of expertise.
14dl04 – Evaluating Web-based Support Tools for Virtual Social Networking				
14dl04-1	Evaluating Web-based Support Tools for Virtual Social Networking	Active (31 Mar 10)	J. Crebolder (Toronto)	To assess web-based collaborative tools that might be used to support a virtual social networking application.
14dm – Human Effectiveness in Sustained Operations and Adverse Environments				
14dm01 – Predictive Frameworks for Fatigue				
14dm01-1	Predictive Frameworks for Fatigue	Active (31 Mar 11)	O. Vartanian (Toronto)	To develop a scientifically validated framework for the quantification of the physiological and psychological stressors on human performance.

**Table C1: Details on Other DRDC Personnel Research That Could Have Implications for the Navy (cont.)**

14dm02 – Mathematical Modelling of Fatigue				
14dm02-1	Mathematical Modelling of Fatigue	Active (31 Mar 12)	F. Bouak (Toronto)	To generate experimental data to test the framework and develop models.
14dm03 – Fatigue Countermeasures				
14dm03-1	Fatigue Countermeasures	Active (31 Mar 12)	O. Vartanian (Toronto)	To develop intervention strategies (e.g. educational, training, etc.) to mitigate the effects of stressors on performance.
14dn – Virtual Reality for Team Training				
14dn01 – Fused Reality Visual Display				
14dn01-1	Fused Reality Visual Display	Active (31 Mar 15)	L. Magee (Toronto)	To develop and assess methods for extending virtual simulations to operators who need to interact physically and directly with their environments.
14dn02 – Simulated Operators for Networks				
14dn02-1	Simulated Operators for Networks	Active (31 Mar 15)	B. Cain (Toronto)	To develop, implement and assess simulated operators for interactive, networked team training environments as a substitute for missing personnel.
14dn03 – Virtual Crewmember				
14dn03-1	Virtual Crewmember	Active (31 Mar 15)	L. Magee (Toronto)	
<b>Thrust 14e – Medical Intervention</b>				
<b>Project #</b>	<b>Title</b>	<b>Status / End Date</b>	<b>Project Mgr / Delivery Centre</b>	<b>Objective</b>
14em – Training of Medical First Responders				
14em01 – Training of Civilian NBC First Responders				
14em01-1	Training of Civilian NBC First Responders	Active (31 Mar 18)	T. Sawyer (Suffield)	To carry out training of civilian NBC first responders
14em02 – Training of Military NBC First Responders				
14em02-1	Training of Military NBC First Responders	Active (31 Mar 18)	T. Sawyer (Suffield)	To carry out training of military NBC first responders
14em03 – Training of Military NBC First Responders (Trauma Only)				
14em03-1	Training of Military NBC First Responders (Trauma Only)	Active (31 Mar 18)	T. Sawyer (Suffield)	To carry out training of military medical personnel responding to trauma injury.

**Table C1: Details on Other DRDC Personnel Research That Could Have Implications for the Navy (cont.)**

<b>Thrust 15a – Command and Control</b>				
<b>Project #</b>	<b>Title</b>	<b>Status / End Date</b>	<b>Project Mgr / Delivery Centre</b>	<b>Objective</b>
15ag -	Enhanced CF Influence Operations	Active (31 Mar 12)	K. Stewart (Toronto)	To enhance the CF's ability to plan, implement and evaluate defensive and offensive Influence Operations based on an increased understanding of the role of cognitive and socio-cultural factors in affecting the perception, attitude, intent and behaviour of selected target audiences.
<b>Thrust 15d - Intelligence</b>				
<b>Project #</b>	<b>Title</b>	<b>Status / End Date</b>	<b>Project Mgr / Delivery Centre</b>	<b>Objective</b>
15dm -	Understanding and Augmenting Human Analytical Capabilities	Active (31 Mar 12)	D. Mandel (Toronto)	To develop superior understanding of human capabilities and capability requirements for sound and effective intelligence production, especially intelligence assessments and analysis, through a program of applied scientific research.



## **Annex D – Other DRDC Research That Could Have Personnel Implications for the Navy**

---

Whereas Annexes B and C focus on personnel research that is being done for either the Navy specifically or other CF clients, this Annex focuses on other types of research being conducted by DRDC that could possibly have personnel implications for the Navy, such as the development of new concepts or capabilities (see Table 3 in the main body of the paper). For example, almost the entire PG 1 – Maritime research program (other than those projects that have already been included in Annex B) is included in this table, since any new concept or capability can have personnel implications, from new skill sets required to possible compensation or occupational structure ramifications. It is important to consider these types of implications early in the development phase so that the HR system can adjust accordingly before the concept or capability is implemented.

Other fields of research that are included in this Annex involve medical interventions and hazard protection, which are conducted mainly at DRDC Suffield. The objective of medical intervention and hazard protection research within the CF context is to develop capabilities required to improve operational sustainability for the CF under both chemical, biological, radiological (CBR) and non-CBR threat conditions, expanding knowledge and capabilities that could also be used to support the Government of Canada's mandate in their battle against CBR terrorism as well as operational/environmental health and combat casualty care (DGMPPRA, 2009). Whereas it might be argued that these types of research should be included in Annex C since they may ultimately impact personnel, either from a threat or protection perspective, results from these areas are more the concern of CFHS as opposed to the Navy or another environment. That being said, activities related to these fields of research are included for informative purposes since it could be naval personnel who are placed in harm's way and could benefit from the results of these studies.

The projects listed below are based on a review of CPME that was carried out in February 2010. The project number follows the convention of the first digit referring to its business line, the second digit referring to its partner group, the third digit referring to its thrust, the fourth digit referring to the project, and the fifth digit, if there is one, referring to the work breakdown element. End dates are provided to give the reader an idea of how long the project is expected to take to completion, and the project manager and DRDC delivery centre are provided in case the reader wants to contact them for further details.

**Table D1: Details on Other DRDC Research That Could Have Personnel Implications for the Navy**

<b>Thrust 10a - Strategic &amp; Future Environment</b>				
<b>Project #</b>	<b>Title</b>	<b>Status / End Date</b>	<b>Project Mgr / Delivery Centre</b>	<b>Objective</b>
10ab -	Scenario Development, Scanning and Analysis	Active (31 Mar 11)	C. Morrisey (CORA)	To examine the future security environment in order to ensure that the CF can set and maintain a coherent force structure strategy for what lies ahead; to develop and update as required the CDS approved set of scenarios to provide "real world" operational situations to bring greater precision to military assessments of the capabilities and force structure that may be required to support a particular operation.
<b>Thrust 10b - Operations Analysis and Integrated Solutions</b>				
<b>Project #</b>	<b>Title</b>	<b>Status / End Date</b>	<b>Project Mgr / Delivery Centre</b>	<b>Objective</b>
10bg –	Support to Major Capital Projects and Life Cycle Costing Analysis	Active (31 Mar 11)	B. Kaluzny (CORA)	To support the Acquisition Support Teams, including PMO JSS (10bg03), PMO AOPS (10bg04), PMO FELEX (10bg05).
10bp -	Understanding Complex Dynamic Systems	Active (31 Mar 12)	M. Ducharme (Valcartier)	To complement current research performed in the IMAGE project (PG 0 TIF) on advanced technological support to the comprehension of complex military operations, where complexity lies at the intersection of system properties, human capabilities and technology.

**Table D1: Details on Other DRDC Research That Could Have Personnel Implications for the Navy (cont.)**

<b>Thrust 10d - Hazard Protection</b>				
<b>Project #</b>	<b>Title</b>	<b>Status / End Date</b>	<b>Project Mgr / Delivery Centre</b>	<b>Objective</b>
10da -	Development of Assays and Evaluation of New Platforms for Biological Identification	Active (31 Mar 13)	B. Lee (Suffield, Valcartier)	To close the gap in detect-to-warn in providing stand-off and potential personal biodetection capabilities; to develop threat identification technologies based on immunoassay, genomic and proteomic (reagentless) approaches for incorporation into current, mini, and man portable identification systems; and to work towards future automation and integration with detection systems.
10db -	Bioaerosol Sensing, Mapping, Tracking, and Classifying System	Active (31 Mar 13)	J.R. Simard (Valcartier, Suffield)	To build and demonstrate a spectrometric LIF LIDAR scanning device to detect, map, track and classify bioaerosol threats from multi-kilometre distances with a positive detection and false alarm rate compatible with CF operational requirements.
10dc -	Stand-off and Field Detection and Identification of Chemical Agents	Active (31 Mar 13)	J. Hancock (Suffield, Valcartier)	To provide a stand-off capability to measure surface contaminants, solids and liquids (including TICs and LVAs) and evaluate technologies for a common CBR platform. It will also research technologies that can be incorporated into mini or personal detectors.
10dd -	New Concepts for Radiological Detection and Identification	Active (31 Mar 13)	L. Erhardt (Ottawa)	To assist the CF in operations in modern radiological threat environments currently dominated by "Defence Against Terrorism" activities. This protection includes better characterization of radioactive fields, and subsequent personnel protection. This is accomplished via state-of-the-art technological advances, field trials and exercises.
10de -	Development of Risk Assessment Techniques and Tools	Active (31 Mar 13)	L. Erhardt (Ottawa, Suffield)	To develop key enabling technology for the fusion of CBRN sensor information with state-of-the-art atmospheric dispersion models. Risk analysis will have specific focus on techniques to mitigate attack with radiological dirty devices.

**Table D1: Details on Other DRDC Research That Could Have Personnel Implications for the Navy (cont.)**

10df -	Assessment of Enhanced and Novel Materials for Personnel Protection	Active (31 Mar 13)	S. Duncan (Suffield, RMC)	To develop unique solutions to enhance soldier and asset survivability, reduce burden and optimize performance output, using core technologies derived from the fields of nanoscience, polymer science and materials behaviour science.
10dg -	Concepts of Sensitive Equipment Decontamination	Active (31 Mar 13)	A. Burczyk (Suffield)	To develop strippable and self-decontaminating chemical agent resistant coatings, along with a dye indicator system for identifying contaminated areas.
10di -	CB Combat Duty Uniform TDP	Active (31 Mar 10)	K. Caldwell (DGRDP)	To investigate the integration of chemical, biological and TIMs protection in a daily wear combat uniform; and to validate the performance through system level performance studies in a state of the art system level test chamber also designed and developed under this TDP.
10dk -	Universal CBR Portable Badge Sensor	Active (31 Mar 13)	D. Pedersen (Suffield, Ottawa)	To develop a portable, low-power, badge-type sensor for biological, chemical and radiation detection that would warn the soldier of an exposure event, track the performance of protective gear, and track the exposure dosage in real time.
10dl -	Polarization-modulated IR Standoff Surface Chemical Detection	Active (31 Mar 13)	M. Petryk (Suffield, Valcartier)	To address a recognized CF capability gap in standoff detection through an innovative approach of using polarization-modulated infrared light to detect contaminants on surfaces, enabling the detection of low volatility chemical warfare agents on surfaces in a non-contact manner.
10dm -	IPE for Radiation Protection	Active (31 Mar 13)	L. Erhardt (Ottawa, RMC)	To evaluate the efficacy of current and future CF IPE in radiological threat environments and enhance IPE with detectors to warn if the suit becomes a radiological hazard due to contamination.
10dn -	CBRN Stand off System	Active (31 Mar 13)	M. Desrosiers (Ottawa, Valcartier, Suffield)	To define the way forward for the development of a combined CBRN standoff detection system. The roadmap for development will be based on systematic studies of promising CBRN standoff technologies, with an eye to both multi-purpose and combined systems.



**Table D1: Details on Other DRDC Research That Could Have Personnel Implications for the Navy (cont.)**

<b>Thrust 11a - Above Water Warfare</b>				
<b>Project #</b>	<b>Title</b>	<b>Status / End Date</b>	<b>Project Mgr / Delivery Centre</b>	<b>Objective</b>
11ac -	ESM for Detection and Identification of Low Probability of Intercept Radars	Active (31 Mar 10)	J. Lee (Ottawa)	To develop ESM technology and algorithms for the detection and identification of LPI radar signals.
11ag -	Advanced Concepts for Naval MFR	Active (31 Mar 10)	P. Moo (Ottawa)	To conduct simulation studies and construct an experimental phased array test bed to specify radar performance requirements for upcoming naval acquisition programs; and to develop technology insertion options for performance improvements of future naval radars.
11ah -	Advanced EO/IR Surveillance in the Littoral	Active (31 Mar 11)	D. Dion (Valcartier)	To develop the know-how and tools for automatic Detection and Identification of small targets (at sea and shore-based), and thus improve industry capability in this field; to produce validated decision support tools to assist operations and for tactical use; to provide guidance to Director Maritime Ship Support (DMSS) on upgrades of current capabilities and procedures, especially with respect to the next generation of IRST surveillance (after SIRIUS) for the navy; and to provide advice, data and models to D Met OC and the CF Maritime Warfare Centre (CFMWC).
11ai -	UAV Concepts and Payloads for Maritime Warfare	Active (31 Mar 12)	W. Chamma (Ottawa, Valcartier, CORA, NRC)	To develop and investigate new payloads and operational concepts of organic tactical UAVs for Maritime Warfare to support and/or replace shipboard sensors and communications systems: 1) Extend the naval ship's on-board sensor/communication systems to beyond line of sight (BLOS); 2) Naval support to land forces in the littoral; 3) UAV/CF naval ships integration for launch and recovery and/or C3 as well as a capability to evaluate the merits of proposed UAV recovery systems.

**Table D1: Details on Other DRDC Research That Could Have Personnel Implications for the Navy (cont.)**

11aj -	Above Water Warfare System Integration	Active (31 Mar 11)	S. Gauthier (Ottawa)	For ship survivability and for optimal operational success, the Cdn navy must be apprised of optimal methods of using sensors and weapons. This project will advance information sharing and cueing methods to improve the Maritime Tactical Picture and ship protection. This project will produce concepts and methods for more effective integration of current sensor and weapon systems. It will also produce decision-aid tools and algorithms to assist the operator in decision making, thus supporting CFMWC tactics development. The project will provide guidance to DMSS on upgrades to current capabilities and on the Destroyer Replacement Program. The project will advance the development of a critical mass of expertise for system integration.
11al -	Direct Client Support - AWW	Active (31 Mar 11)	T. Ollevier (Ottawa)	To capture direct support to naval AWW requirements. This will include collecting data to refine models for use in assessing Electronic Attack (EA) system performance and expertise to advise the CF in evolving EA technologies for future platforms. Canadian participation at the RIMPAC 08 trials will leverage a modest Cdn cost to access millions of dollars worth of US, UK and AUS assets, threat simulators, experimental systems and trial ships. This was successfully done with TARA I at RIMPAC 06 trials where \$250K of CF funding was leveraged to access >\$2M of AUS, UK and US assets. TARA II at RIMPAC 08 is on track to be just as successful.
11am -	Support to Major Crown Projects - AWW Requirements	Active (31 Mar 11)	M. Tunnicliffe (Corp)	To deliver timely advice to the Destroyer Replacement Project team on AWW issues on an as-tasked basis.

**Table D1: Details on Other DRDC Research That Could Have Personnel Implications for the Navy (cont.)**

11an -	Laser Optical Countermeasures and Surveillance Against Threat Environment Scenarios TDP	Active (31 Mar 12)	F. Reid (Valcartier)	To detect, locate and counter laser assisted threats for ships in the littoral; and to detect and locate military optics and optically assisted weapons on the coast. This TDP will provide recommendations on best possible technological approach to laser/optical protection and will quantify their impact on the defence of Canadian Navy ships, with and without the countermeasures.
11ao -	Counter Anti-Ship Supersonic Sea Skimming Missiles	Active (31 Mar 12)	A. Jeffrey (Valcartier)	To develop an integrated capability (architecture) for the analysis of ship self and area defence against the supersonic sea-skimming missile threat, covering the entire kill chain. The process will then be demonstrated by performing trade-off analysis of defence system components ("as is" baseline and "to be") to determine levels of protection against this particular threat.
11ap -	Defence Against Future RF Threats	Active (31 Mar 13)	T. Ollevier (Ottawa)	To improve defence of naval platforms against modern radars used for target acquisition on launch aircraft and terminal homing on anti-ship missiles (ASMs). Improvements to current and future threats are reducing the reaction time available for ship defence. The desired outcome of this project is to improve the survivability of naval platforms through the synergistic use of all of the EA assets on a platform(s) to provide the best possible protection.
11aq -	Near Field and mm-wave Radar Cross Section (RCS) in the Maritime Environment	Active (31 Mar 12)	S. Legault (Ottawa)	To reduce observability through passive radar signature management; to improve DRDC expertise and facilities for the assessment and prediction of the RCS of naval vessels; to increase fidelity of numerically predicted RCS values of RF and mm-wave frequencies; to improve characterization and methodologies for RCS measurements in the marine environment.

**Table D1: Details on Other DRDC Research That Could Have Personnel Implications for the Navy (cont.)**

<b>Thrust 11b - Maritime Command and Control</b>				
<b>Project #</b>	<b>Title</b>	<b>Status / End Date</b>	<b>Project Mgr / Delivery Centre</b>	<b>Objective</b>
11bb -	Development of Robust Services for Target Recognition & Identification (R&I) in Naval Tactical Operations	Active (31 Mar 12)	P. Valin (Valcartier)	To improve the R&I capabilities of a Task Force in joint/coalition missions, including requirements for software upgrades of naval command and control (C2) systems concerning improved R&I, e.g. for CSC, MTMD BMCHI, and FELEX/HCM.
11bc -	Maritime Specific Communications Requirements - Scoping Study	Active (31 Mar 12)	E. Bosse (Valcartier)	To identify areas that warrant further research from a maritime perspective.
11bd -	Coalition Maritime Missile Defence TDP	Active (31 Mar 13)	L. St Pierre (Valcartier)	
11bs -	Common Tactical Picture (CTP) Compilation for Maritime Task Groups	Active (31 Mar 11)	A. Benaskeur (Valcartier)	To investigate an integrated approach to data/information gathering (sensor management) and fusion (distributed fusion) in support to the compilation of a CTP among Maritime Task Group participants. This will allow the task group to maximize the task-related value of the collected/fused information in order to: 1) Increase the reaction time; 2) Increase the higher discrimination power in dense littoral environments; and 3) Minimize the yet high risk of collateral damages / fratricides.
11bv -	Threat and Intent Assessment in Littoral Context	Active (31 Mar 11)	H. Irandoust (Valcartier)	To investigate decision aid concepts and technologies to support SCF tactical picture exploitation and management. In particular, this project will investigate and develop 1) models, simulations and assessments of SCF C2/I2 processes, and 2) decision aids to support adversary threat and intent assessment in littoral set up.
11bx -	Maritime Open Architecture Combat Management System Testbed	Active (31 Mar 11)	M. Lefrancois (Atlantic)	To develop a systems engineering testbed to explore issues of Modular Open Systems Architecture as applied to Combat Management Systems for DRP and future combatant classes.

**Table D1: Details on Other DRDC Research That Could Have Personnel Implications for the Navy (cont.)**

11by -	Direct Client Support Maritime C2	Active (31 Mar 11)	D. Hazen (Atlantic)	To provide support to Maritime Command and Control activities as defined by and resourced by other agencies as detailed in individual tasks under MARCORD 02-03.
11bz -	Support to DEE - Maritime Modelling and Simulation	Active (31 Mar 11)	M. Hazen (Atlantic)	To provide support to other customers as requested.
<b>Thrust 11c - Underwater Warfare</b>				
<b>Project #</b>	<b>Title</b>	<b>Status / End Date</b>	<b>Project Mgr / Delivery Centre</b>	<b>Objective</b>
11cb -	Automated Clutter Discrimination Using Aural Cues	Active (31 Mar 12)	P. Hines (Atlantic)	To develop and integrate an automatic clutter discrimination tool into the PLIEADES Testbed (or similar type of testbed) for use on CF assets to reduce unacceptably high rates of false alarms.
11cc -	Deployable Sensor Pods with Digital Signal Processing	Active (31 Mar 11)	G. Heard (Atlantic)	To implement reliable short-range wireless underwater communications capabilities in support of deployable, autonomous systems, diver and UAV applications, and submarine ISR.
11cd -	Underwater Signature Applications for Naval Platforms	Active (31 Mar 10)	L. Gilroy (Atlantic)	To provide specifications of a forward ranging capability (both ASW and Mine Warfare (MW)) to both surface ships and submarines and to develop validated underwater signature models including radiated noise, target echo strength and EM signatures for the VCS.
11ce -	Advanced Torpedo Defence Concepts	Active (31 Mar 12)	M. Trevorrow (Atlantic, CORA)	To develop improved algorithms, models and system concepts, for surface-ship torpedo defence.
11cf -	Mine and Harbour Defence	Active (31 Mar 12)	M. Seto (Atlantic, Suffield, Valcartier)	To place the CF and OGDs in a better position for specifying and procuring systems against underwater threats.
11ch -	Assessing Sonar Performance in Realistic Environments (ASPIRE)	Active (31 Mar 12)	J. Osler (Atlantic, Ottawa)	To develop the capability to sample the underwater environment in an adaptive and optimal manner that will enhance tactical decision making for ASW by means of sonar performance predictions and uncertainties that are based on realistic environmental parameters and are integrated into an ASW tactical picture.

**Table D1: Details on Other DRDC Research That Could Have Personnel Implications for the Navy (cont.)**

11cj -	Direct Client Support - Cooperative ASW	Active (31 Mar 15)	N. McCoy (Atlantic)	To provide DEE support to ASW activities led by other agencies.
11ck -	Direct Client Support - Mine Defence and Port Protection	Active (31 Mar 15)	N. McCoy (Atlantic, CORA)	To provide support to DEE activities associated with mine defence, MCM and port protection.
11cm -	Direct Client Support - Torpedo Defence	Active (31 Mar 15)	N. McCoy (Atlantic, CORA)	To provide support to DEE activities related to torpedo detection and underwater engagement modelling.
11cn -	Direct Client Support – Underwater Environmental Battlespace	Active (31 Mar 15)	N. McCoy (Atlantic, CORA)	To provide support to DEE activities associated with assessing the underwater environmental battlespace and managing environmental data.
11co -	Direct Client Support - Underwater Signatures	Active (31 Mar 15)	N. McCoy (Atlantic)	To support DEE activities associated with modeling, measurement and mitigation of underwater acoustic and electromagnetic signatures.
11cp -	Direct Client Support - Diving and Underwater Intervention	Active (31 Mar 15)	E. King (Toronto, Atlantic)	To support Diving and Underwater Intervention DEE.
11cr -	Direct Client Support - CSC UW Requirements	Active (31 Mar 15)	N. McCoy (Atlantic)	Response to taskings from Destroyer Replacement Project Office.
11ct -	Support to Maritime Operations	Active (31 Mar 15)	N. McCoy (Atlantic, Ottawa, CORA)	To provide embedded DS support and advanced technology to Op Altair Roto 4 and future rotos; to support the CTAS mission in CF 150 AOR; and to rapidly field select technologies.
11cu -	Cornerstone - UAV Activity in Support of UNCLOS	Active (31 Dec 13)	E. MacNeil (Atlantic)	
11cy -	Support to DEE Miscellaneous UWW Activities	Active (31 Dec 12)	N. McCoy (Atlantic)	
11cz -	Underwater Warfare (UWW) Miscellaneous Activities	Ongoing	D. Hazen (Atlantic)	This is an ongoing project consisting of UWW R&D activities that have broad UWW applications, or do not fit in the scope and duration of existing UWW projects.
<b>Thrust 11g - Naval Platform Technology</b>				
<b>Project #</b>	<b>Title</b>	<b>Status / End Date</b>	<b>Project Mgr / Delivery Centre</b>	<b>Objective</b>
11ga -	Support to DEE - VICTORIA Class Service Level Agreement (SLA)	Active (31 Mar 10)	W. Temple (Atlantic)	To optimize VCS availability; to improve communication between stakeholders; to participate within submarine support community; to strengthen Canadian industry's ability to provide support; and to address initial problematic subject areas.

**Table D1: Details on Other DRDC Research That Could Have Personnel Implications for the Navy (cont.)**

11gb -	Direct Client Support - Dockyard Laboratory Science Support	Ongoing	Y. Wang (Atlantic)	To provide scientific consulting services to the Navy and Maritime Air by the DRDC Atlantic Dockyard labs located on the east and west coasts.
11gd -	Naval Protection Materials	Active (31 Mar 12)	J. Szabo (Atlantic, Suffield, Valcartier)	To increase the survivability of naval platforms through the development of state-of-the-art materials against emerging and novel threats, and to make recommendations for the implementation of these materials on CF naval platforms.
11gq -	Maritime Force Protection TDP	Active (31 Mar 10)	A. Hewitt (Atlantic, CFMWC, CORA)	To develop and demonstrate affordable prototype systems for detection and mitigation of terrorist threats against CF vessels, and for enhancing survivability and recoverability in the event of an attack. The system will be for on-board response to real and current threats and for use in concept development and experimentation.
11gs -	Platform Stealth	Active (31 Mar 10)	Z. Daya (Atlantic)	To provide technologies and advice for monitoring, prediction, and reduction of signatures in support of SCSC and VCS programs, including demonstration signature management programs and studies on susceptibility and on stealth materials.
11gw -	Seakeeping Operator Guidance (SOG)	Active (31 Mar 11)	J. Colwell (Atlantic)	To develop a concept demonstration SOG capability for real time (RT) and tactical (TAC) operator guidance with accurate measurement of wave height and directional spectra using shipboard sensors.
11gx -	Global Operation and Life Extension of the VCS	Active (31 Mar 11)	M. Mackay (Atlantic)	To advise the CF on operating the VCS globally, including in littoral and northern waters, and on the life expectancy of the pressure hull and critical components.
11gy -	Technologies for Fire and Damage Control and Condition-based Maintenance	Active (31 Mar 11)	J. Hiltz (Atlantic)	To incorporate reliable, robust and cost effective materials and fire and damage control and condition based maintenance technologies into future ships.
11gz -	Direct Client Support - Naval Platform Activities	Ongoing	N. McCoy (Atlantic)	To provide selected materials science studies and services to OGDs and selected clients.

**Table D1: Details on Other DRDC Research That Could Have Personnel Implications for the Navy (cont.)**

<b>Thrust 11h - Maritime Domain Awareness</b>				
<b>Project #</b>	<b>Title</b>	<b>Status / End Date</b>	<b>Project Mgr / Delivery Centre</b>	<b>Objective</b>
11hj -	PASE - Persistent Active Surveillance of the Exclusive Economic Zone (EEZ) TDP	Active (31 Mar 12)	D. DiFilippo (Ottawa)	To 1) conduct comparative analysis of sensor technologies that can potentially meet requirements for persistent, active surveillance of the EEZ within a 10 yr timeframe; and 2) demonstrate next-generation HF SWR technology that complies with Industry Canada spectrum management guidelines for long-term operation, while maintaining acceptable detection and tracking performance.
11hk -	Multi-Hypothesis Link Analysis for Anomaly Detection in the Maritime Domain	Active (31 Mar 12)	J. Roy (Valcartier, Atlantic, Ottawa)	To study, develop, and implement a link analysis tool to support anomaly detection, the identification of vessels of interest, and threat analysis in the maritime domain.
11hn -	Maritime Security Planning Tools and Analysis	Active (31 Jun 13)	A. Wind (CORA)	To explore, develop, demo, test, evaluate and facilitate implementation of planning tools and conduct analysis to improve op concepts, situational awareness and asset deployment in conducting maritime surveillance and interdiction operations at home and away.
11hz -	Direct Client Support - Maritime Domain Awareness Activities	Active (31 Mar 12)	N. McCoy (Atlantic, Ottawa, Toronto, Valcartier)	To provide an umbrella for Maritime Domain Awareness activities in support of DND's DEE objectives.
<b>Thrust 11i - Integrated Maritime Decision Support</b>				
<b>Project #</b>	<b>Title</b>	<b>Status / End Date</b>	<b>Project Mgr / Delivery Centre</b>	<b>Objective</b>
11ia -	Operations Analysis for Maritime Force Development, Production and Strategy	Active (31 Mar 13)	P. Massel (CORA)	To conduct studies supporting planning and decision making related to future fleet composition, manning, and in support of specific client capital project options analysis.



**Table D1: Details on Other DRDC Research That Could Have Personnel Implications for the Navy (cont.)**

11ib -	Operations Analysis for Maritime Force Employment & Generation	Active (31 Mar 13)	P. Saunders (CORA)	To support the short term employment of Maritime Forces, the development of tactics for MF using current equipment, and the establishment of metrics and techniques for reporting readiness of MF.
11ic -	Force Structure Analysis Tool for Capability Based Planning	Active (31 Mar 13)	C. Eisler (CORA)	To expand the utility of the Navy's Capability Based Planning simulation tool (Tyche) to inform the navy more accurately on strategic planning, procurement, and usage of force structures (including platforms, equipment, and personnel).
<b>Thrust 12o - Land Command</b>				
<b>Project #</b>	<b>Title</b>	<b>Status / End Date</b>	<b>Project Mgr / Delivery Centre</b>	<b>Objective</b>
12of -	Situational Analysis of Tactical Army Commanders	Completed (1 Jun 09)	E. Dorion (Valcartier, Ottawa, Toronto, CORA)	To apply and exploit the state-of-the-art science and technology of Situational Analysis and Information Fusion for the Tactical Commander.
12oi -	Auditory Overload in CF Land Operations	Active (31 Mar 11)	S. Abel (Toronto, Atlantic)	To upgrade communications capability, situational awareness and attention.
<b>Thrust 13p - Air Sustain</b>				
<b>Project #</b>	<b>Title</b>	<b>Status / End Date</b>	<b>Project Mgr / Delivery Centre</b>	<b>Objective</b>
13pg -	Air Crew Neck Strain Mitigation	Active (31 Mar 11)	B. Fraser (Toronto, NRC)	To identify technologies and provide scientific guidance to mitigate the adverse effects of CF aircrew wearing head-mounted display technologies.

**Table D1: Details on Other DRDC Research That Could Have Personnel Implications for the Navy (cont.)**

<b>Thrust 14d - Human Integration</b>				
<b>Project #</b>	<b>Title</b>	<b>Status / End Date</b>	<b>Project Mgr / Delivery Centre</b>	<b>Objective</b>
14dd -	Human Centric Architecture Framework (Human Views Development – 14dd01)	Active (31 Mar 12)	W. Dyck (Toronto)	To identify dynamic core Human Views within the DND Architectural Framework to show how the human component within a “S of S” construct will impact system or capability performance (e.g. mission performance, safety, supportability, cost).
<b>Thrust 14e - Medical Intervention</b>				
<b>Project #</b>	<b>Title</b>	<b>Status / End Date</b>	<b>Project Mgr / Delivery Centre</b>	<b>Objective</b>
14ea -	Virulence Factors and Rapid Post-Exposure Protection TDP	Active (31 Mar 12)	J. Wu (Suffield)	To identify virulence factors, and develop and evaluate novel vaccine candidates and treatment models that can protect the CF from the threats of different biological warfare agents and endemic diseases.
14eb -	Novel Therapeutics and Drug Delivery	Active (31 Mar 11)	B. Berger (Suffield)	To understand the mechanistics of protection (multiplexed arrays for biological threat agents and toxins) and to develop novel immunomodulating therapeutic agents as broad spectrum 'platform' countermeasures.
14ec -	Nucleic Acid-Based Antiviral Drugs	Active (31 Mar 11)	D. Van Loon (Suffield, Corporate)	To demonstrate and develop gene-based drugs as broad-spectrum antiviral agents to combat endemic and biological viral threat agents.
14ee -	Quantum Dot Diagnostics	Active (31 Mar 13)	E. Stephen (Suffield)	To demonstrate a handheld, diagnostic tool for the simultaneous identification of multiple pathogens or biothreat agents in clinical or environmental samples.
14ef -	Medical Countermeasures Against Classical Chemical Weapon Agents	Active (31 Mar 13)	S. Bjarnason (Suffield)	To assess and develop medical countermeasures against the classical chemical weapon agents such as vesicants and nerve agents.
14eg -	Investigations into the Mechanism of Action of Chemical Weapon Agents	Active (31 Mar 12)	S. Bjarnason (Suffield)	To investigate the mechanisms of action of chemical weapon agents, through the use of animal model systems and exposure systems.

**Table D1: Details on Other DRDC Research That Could Have Personnel Implications for the Navy (cont.)**

14eh -	MCM Against Radiological Weapon Agents	Active (31 Mar 12)	D. Wilkinson (Ottawa)	To evaluate and mitigate the deleterious effects of ionizing radiation, alone or in combination with other stressors encountered by the CF.
14ei -	Diagnostic Technologies in Casualty Care	Active (31 Mar 13)	S. Stergiopoulos (Toronto)	To complete the development of DRDC's fully digital 3D ultrasound imaging technology as a portable & field deployable industrial prototype ready for regulatory approvals to allow for clinical evaluation by the Canadian Forces Health Services Group for field operations.
14ej -	Combat Fluid Resuscitation Interoperable Capability TDP	Active (31 Mar 11)	S. Rhind (Corporate, Toronto)	To evaluate new fluids for combat resuscitation, which may offer significant advantages in patient survivability and inflammatory response, post-trauma outcomes, and fluid quantity requirements.
14ek -	Development of Triage Algorithms for Mass Casualty Scenarios	Active (31 Mar 12)	S. Bjarnason (Suffield)	To develop a triage algorithm for OP mass casualties that is evidence-based.
14en -	Portable 3D/4D Ultrasound Diagnostic Imaging System TDP	Active (31 Mar 12)	P. Shek (Suffield)	
14eo -	Enhanced Healing of Thermal Burn Wounds by Umbilical Cord Mesenchymal Stem Cells	Active (31 Mar 14)	L. Nagata (Toronto)	
14er -	Broad Spectrum Medical Countermeasures Against Mustard Agents and Radiation	Active (31 Mar 15)	S. Bjarnason (Suffield)	
14es -	Medical Countermeasures Against Blast Induced TBIs in Animals	Active (31 Mar 15)	S. Bjarnason (Suffield)	
<b>Thrust 15a - Command and Control</b>				
<b>Project #</b>	<b>Title</b>	<b>Status / End Date</b>	<b>Project Mgr / Delivery Centre</b>	<b>Objective</b>
15ab -	Multi-Level Plan Execution Monitoring	Active (31 Mar 12)	M. Belanger (Valcartier, Toronto)	To contribute to the definition of critical aspects of a collaborative environment that will enable the execution, management and monitoring of plans at different levels of command.



## List of acronyms

---

ACSO	Air Combat Systems Officer
ADAC(A)	Acoustic Data Analysis Centre (Atlantic)
ADM(HR-CIV)	Assistant Deputy Minister (HR-Civilian)
ADM(MAT)	Assistant Deputy Minister (Materiel)
ADM(PA)	Assistant Deputy Minister (Public Affairs)
ADR	Alternate Dispute Resolution
AEC	Aerospace Controller
AERE	Aerospace Engineer
AFC	Armed Forces Council
AMOR	Annual Military Occupational Review
AOPS	Arctic/Offshore Patrol Ship
AoT	Army of Tomorrow
BMQ	Basic Military Qualification
BTL	Basic Training List
C3	Command, Control, and Communications
C4ISR	Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance
CAPT(N)	Captain (Navy)
CAS	Chief of Air Staff
CBR	Chemical, Biological, Radiological
CBRN	Chemical, Biological, Radiological, Nuclear
CFTPO	Canadian Forces Taskings, Plans and Operations
CDR	Commander
CEOTP	Continuing Education Officer Training Plan
CF	Canadian Forces
CFAT	Canadian Forces Aptitude Test
CFCOD	Canadian Forces College Opportunities Database
CFNES	Canadian Forces Naval Engineering School
CFPAS	Canadian Forces Performance Appraisal System
CFRG	Canadian Forces Recruiting Group
CMP	Chief of Military Personnel
CMS	Chief of Maritime Staff
COMD	Commander Maritime Atlantic
MARLANT	

CORA	Centre for Operational Research and Analysis
CPME	Collaborative Planning and Management Environment
CPO1	Chief Petty Officer First Class
CQ	Cultural Intelligence
CSC	Canadian Surface Combatant
CSS	Centre for Security Science
CT	Collective Training
CTP	Common Tactical Picture
DGCB	Director General Compensation and Benefits
DGMEPM	Director General Maritime Equipment Program Management
DGMFD	Director General Maritime Force Development
DGMPR	Director General Maritime Personnel & Readiness
DGMPRA	Director General Military Personnel Research & Analysis
DGMSM	Director General Maritime Strategic Management
DGNP	Director General Naval Personnel
D MAR PERS	Director Maritime Personnel
DMCPR	Director Maritime Civilian Personnel Requirements
DMS	Director Maritime Strategy
DMTE	Director Maritime Training and Education
DND	Department of National Defence
DP1	Development Period One
DQOL	Director Quality of Life
DRDC	Defence Research and Development Canada
EE	Employment Equity
FELEX	Frigate Life Extension
FEWG	Fleet Efficiency Working Group
FMN	Formation
FNRWG	Future of the Naval Reserve Working Group
FY	Fiscal Year
GIS	Geographic Information System
HCM	Halifax-Class Modernization
HDO	Human Dimensions of Operations
HF	Human Factors

HLTA	Home Leave Travel Allowance
HMCS	Her Majesty's Canadian Ship
HQ	Headquarters
HR	Human Resources
IRP	Integrated Relocation Program
IT&E	Individual Training and Education
JBS/QRA	Job-Based Specifications/Qualification Requirements Analysis
JIMP	Joint, Interagency, Multi-National, Public
LCDR	Lieutenant Commander
LT	Lieutenant
LT(N)	Navy Lieutenant
MAR ENG	
MECH	Marine Engineering Mechanic
MARCOM	Maritime Command
MARLANT	Maritime Atlantic
MARPAC	Maritime Pacific
MARS	Maritime Surface and Sub-Surface (Officer)
MCCPO	Maritime Command Chief Petty Officer
MCDV	Maritime Coastal Defence Vessel
MFRC	Military Family Resource Centre
MOC	Military Occupation
MORT	Maritime Operational Research Team
MOSART	Military Occupational Structure Analysis Redesign and Tailoring
MOST	Maritime Officer Selection Test
MOU	Memorandum of Understanding
MS ENG	Marine Systems Engineering (Officer)
MSOC	Marine Security Operations Centre
NATO	North Atlantic Treaty Organization
NAV COMM	Naval Communicator
NAVMAC	Navy Manpower Analysis Center
NAVRES	Naval Reserve
NBC	Nuclear, Biological, Chemical
NCI OP	Naval Combat Information Operator
NCM	Non-commissioned Member

NCS ENG	Naval Combat Systems Engineering (Officer)
NDHQ	National Defence Headquarters
NE TECH (R)	Naval Electronics Technician (Radar)
NE TECH (S)	Naval Electronics Technician (Sonar)
NFTC	NATO Flying Training in Canada
NOAB	Naval Officer Assessment Board
NPRST	Navy Personnel Research, Studies and Technologies
NRD	Naval Reserve Division
NRTD	Naval Reserve Training Division
NSAT	Naval Strategic Assessment Team
NSB	Naval Succession Board
NSIT	Naval Strategic Implementation Team
NW TECH	Naval Weapons Technician
OFF	Operational Functioning Point
OJT	On the Job Training
OPI	Office of Primary Interest
OPME	Officer Professional Military Education
PARSim	Production, Absorption, Retention Simulation
PDR	Post-Deployment Reintegration
PG	Partner Group
PIDA	Port Inspector Diver Allowance
PLAR	Prior Learning & Reporting
PML	Preferred Manning Level
PMT	Production Management Tool
PSES	Public Service Employee Survey
PSO	Personnel Selection Officer
PTE	Private
QL	Qualification Level
QOL	Quality of Life
QSP	Qualification Standard and Plan
QSPWB	Qualification Standard and Plan Writing Board
R4	Right Person, Right Qualification, Right Place, Right Time
RMC	Royal Military College



S&T	Science and Technology
SAC	Shipborne Air Controller
SE	Short Engagement
SEP	Subsidized Education Plan
SIP	Strategic Intake Plan
SLt	Sub-Lieutenant
SLT	Second Language Training
SME	Subject Matter Expert
SONAR OP	Sonar Operator
SPQR	Special Personnel Qualification Requirements
STISA	Scientific, Technical and Intelligence Support and Advice
SUBCA	Submarine Crewing Allowance
SUBSPA	Submarine Speciality Allowance
SW	Shallow Water
TDP	Technology Demonstration Program
TES	Trained Effective Strength
TFA	Task Force Afghanistan
TIF	Technology Investment Fund
TOS	Terms of Service
TTCP	The Technical Cooperation Program
UAV	Unmanned Aerial Vehicle
UMP	Unit Morale Profile
US	United States
VAC	Veterans Affairs Canada
VCDS	Vice Chief of Defence Staff
VR	Virtual Reality
VSW	Very Shallow Water

This page intentionally left blank.

## Distribution list

---

Document No.: DRDC CORA TM 2011-xxx

### **LIST PART 1: Internal Distribution by Centre**

DGMFD (1 EC)  
DGNP (1 EC)  
D Mar Pers (1 EC)  
D Mar Strat (1 EC)  
DMTE (1 EC)  
DMCPR (1 EC)  
MARLANT N1 (1 EC)  
MARPAJ J1 (1 EC)  
NAVRESHQ N1 (1 EC)

DRDC CORA – Maritime OR Teams (4 EC)  
DGMPRA (1 EC)  
DGMPRA – DG/CSci (1 EC)  
DRDC Atlantic (1 EC)  
DRDC Toronto (1 EC)  
DST (Personnel) (1 EC)

Command PSO – Navy (LCdr F. Boyes) (1 EC)  
Command PSO – Army (Maj S. Blanc) (1 EC)  
Command PSO – Air Force (Maj R. Morrow) (1 EC)

CORA Library (1 CD, 1 HC)  
Author (1 CD, 1 HC, 1 EC)

---

TOTAL LIST PART 1 (24)

### **LIST PART 2: External Distribution by DRDKIM**

DRDKIM (1 CD)

---

TOTAL LIST PART 2 (1)

**TOTAL COPIES REQUIRED (26)**



DOCUMENT CONTROL DATA		
(Security classification of title, body of abstract and indexing annotation must be entered when the overall document is classified)		
5. ORIGINATOR (The name and address of the organization preparing the document. Organizations for whom the document was prepared, e.g. Centre sponsoring a contractor's report, or tasking agency, are entered in section 8.)  <b>DRDC CORA</b> <b>National Defence Headquarters</b> <b>101 Colonel By Drive</b> <b>Ottawa, Ontario K1A 0K2</b>	2. SECURITY CLASSIFICATION (Overall security classification of the document including special warning terms if applicable.)  <b>UNCLASSIFIED</b>	
5. TITLE (The complete document title as indicated on the title page. Its classification should be indicated by the appropriate abbreviation (S, C, R or U) in parentheses after the title.)  <b>A Gap Analysis of Research Being Conducted on Naval Personnel Issues</b>		
5. AUTHORS (First name, middle initial and last name. If military, show rank, e.g. Maj. John E. Doe.)  <b>Tanner, L.</b>		
5. DATE OF PUBLICATION (Month and year of publication of document.) <b>February 2011</b>	6a. NO. OF PAGES (Total containing information, including Annexes, Appendices, etc.) <b>132</b>	6b. NO. OF REFS (Total cited in document.) <b>26</b>
7. DESCRIPTIVE NOTES (The category of the document, e.g. technical report, technical note or memorandum. If appropriate, enter the type of report, e.g. interim, progress, summary, annual or final. Give the inclusive dates when a specific reporting period is covered.)  <b>Technical Memorandum</b>		
8. SPONSORING ACTIVITY (The name of the department project office or laboratory sponsoring the research and development – include address.)  <b>Chief of Maritime Staff / DRDC CORA</b>		
9a. PROJECT OR GRANT NO. (If appropriate, the applicable research and development project or grant number under which the document was written. Please specify whether project or grant.)	9b. CONTRACT NO. (If appropriate, the applicable number under which the document was written.)	
10a. ORIGINATOR'S DOCUMENT NUMBER (The official document number by which the document is identified by the originating activity. This number must be unique to this document.)  <b>DRDC CORA TM 2011-010</b>	10b. OTHER DOCUMENT NO(s). (Any other numbers which may be assigned this document either by the originator or by the sponsor.)	
11. DOCUMENT AVAILABILITY (Any limitations on further dissemination of the document, other than those imposed by security classification.)  <input checked="" type="checkbox"/> ( X ) Unlimited distribution <input type="checkbox"/> ( ) Defence departments and defence contractors; further distribution only as approved <input type="checkbox"/> ( ) Defence departments and Canadian defence contractors; further distribution only as approved <input type="checkbox"/> ( ) Government departments and agencies; further distribution only as approved <input type="checkbox"/> ( ) Defence departments; further distribution only as approved <input type="checkbox"/> ( ) Other (please specify):		

12.	DOCUMENT ANNOUNCEMENT (Any limitation to the bibliographic announcement of this document. This will normally correspond to the Document Availability (11). However, where further distribution (beyond the audience specified in (11) is possible, a wider announcement audience may be selected.))
	UNLIMITED
13.	ABSTRACT (A brief and factual summary of the document. It may also appear elsewhere in the body of the document itself. It is highly desirable that the abstract of classified documents be unclassified. Each paragraph of the abstract shall begin with an indication of the security classification of the information in the paragraph (unless the document itself is unclassified) represented as (S), (C), (R), or (U). It is not necessary to include here abstracts in both official languages unless the text is bilingual.)
	<p>The Canadian Forces has undergone significant changes in recent years to become a more “integrated, unified and transformed” military. With these changes, however, there are now additional strategic and operational requirements being placed on the various environments. Unfortunately, the Canadian Navy’s establishment has become increasingly inadequate to address these requirements in addition to those that define its institutional role. While a number of initiatives have been identified that will begin to address some of the personnel issues facing the Navy, a coherent research plan in support of those initiatives has not yet been developed. To assist in such an effort, this paper provides an overview of the personnel issues that have been identified by senior naval leadership, examines what relevant research is currently being conducted to address these issues, and discusses opportunities for further research that would assist the Navy’s endeavours in ensuring it has the personnel, both in terms of numbers and skill sets, required for the fleet of tomorrow. There is a considerable amount of research that could be conducted, but this will require coherent program management and utilization of additional research capabilities, such as modelling and simulation, establishing ties with academia and industry, and international collaboration.</p>
14.	KEYWORDS, DESCRIPTORS or IDENTIFIERS (Technically meaningful terms or short phrases that characterize a document and could be helpful in cataloguing the document. They should be selected so that no security classification is required. Identifiers, such as equipment model designation, trade name, military project code name, geographic location may also be included. If possible keywords should be selected from a published thesaurus, e.g. Thesaurus of Engineering and Scientific Terms (TEST) and that thesaurus identified. If it is not possible to select indexing terms which are Unclassified, the classification of each should be indicated as with the title.)
	<p>Naval Personnel  HR Management  Human Factors  Social Science  Research and Analysis</p>



## **Defence R&D Canada**

Canada's Leader in Defence  
and National Security  
Science and Technology

## **R & D pour la défense Canada**

Chef de file au Canada en matière  
de science et de technologie pour  
la défense et la sécurité nationale



[www.drdc-rddc.gc.ca](http://www.drdc-rddc.gc.ca)

